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WHAT AMERICA DID

TROOP TRANSPORT LEAVING NEW YORK FOR FRANCE

WHAT AMERICA DID

A Record of Achievement in the Prosecution of the War

BY

FLORENCE FINCH KELLY

NEW YORK

E. P. DUTTON & COMPANY

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PREFACE

My purpose in this book has been to condense into a brief account just those things that the ordinary man or woman wants to know about how we prepared for and waged our share in the world war. I have tried to picture the large outlines of achievement, to present the important facts, and to show how it was all inspired and rushed forward by the flaming spirit of the people. Volumes will be required, and will of course be written, to tell comprehensively and in detail the complete story of America's many-sided effort in the prosecution of the war. But I have sought, rather, to make such a book as would meet the needs of the every-day reader by disregarding details and weaving into the panorama of our war adventure only the essential facts of each phase of war effort and the spirit by which it was all unceasingly animated.

In such a volume, it seemed to me, there was no place for account of the controversies that have raged over almost every step of progress, nor for mention of criticisms or investigations or even of the mistakes that delayed by a few weeks or a few months the reaching of the peak of achievement in this or that particular. All of them, doubtless, will be chronicled in those many volumes that will tell the story of America's participation in the war comprehensively and in detail. Otherwise, they will all be forgotten in six months. It is achievement that counts, and

this book aims only to be a record of things that were done.

But it is in no boastful spirit and with no vainglorious purpose that "What America Did" is presented. There is no one of the millions who shared in that doing but knows and is glad to say that beside what Britain, or France, or Italy did or Belgium suffered America can only stand with bent head and reverent heart. It is much to be desired that a similar record, presenting outlines and essential facts within a space possible for the reading of the average busy person, of the achievements and sacrifices of each of these nations should be prepared for our own and for coming generations. For the sum total of their testimony would so utterly disprove the old, old lie that a democracy can not be efficient and so summarily cast it into outer darkness that men would never again say it or believe it as long as time lasts. If this little volume is privileged to do its share toward proving that "the highest and best form of efficiency is the spontaneous coöperation of a free people" I shall feel it an honor to have done the work of assembling and presenting its evidence.

To those many officials and temporary assistants of the Government—they are far too many to mention separately—who have given me their cordial and painstaking coöperation in my effort to make all the facts and figures and statements of this work accurate and authoritative I wish to acknowledge my very great indebtedness. Without their constant and most courteous help the book would have been impossible.

FLORENCE FINCH KELLY.

New York City,
May, 1919.

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WHAT AMERICA DID

FOREWORD: ENTERING THE WAR

WHEN the United States entered the war, April 6th, 1917, she had an army, including all the forces of the Regular Army, the National Guard and the Reserve Corps, totaling 202,510 men and 9,524 officers, a navy not large but well prepared, and the nucleus of an aeronautical section so small and undeveloped that it was negligible. Behind these fighting forces that, except the navy, were insignificant in comparison with the vast numbers of men swaying back and forth across the battlefields of Europe was a nation that ever since its birth had held the profound conviction, a fundamental of its political creed, that this country should never allow itself to be drawn into the quarrels of Europe.

Generation after generation had watched transatlantic wars blaze up and go their bloody way and had seen their flames fed by racial hates and jealousies, commercial greed, desire of territory, and dynastic and personal ambitions. And each successive generation had detested more deeply the whole foul crew of those motives and had been more determined that America should have no concern in the struggles they inspired. No one who does not understand how deeply rooted was this conviction in the political beliefs and ideals, the traditions, the very life of the American people can appreciate what it meant to them to plunge into the war. It demanded no less

than a revolution in their methods of thought and in their attitude toward the rest of the world. The Monroe Doctrine, moreover, which for nearly a century had been almost as fundamental in our political life as the Constitution itself, made our abstention from interference in Europe a point of honor. For in its declaration that Europe must keep its hands off the western hemisphere was the implied and recognized obligation that the United States must keep its fingers out of Europe.

Until within a few months of our entrance into the war the vast majority of our people, probably no less than nine-tenths of those who were reading and thinking about it, saw in it nothing more than one of those recurring European quarrels, such as their fathers, grandfathers, and great-grandfathers had watched from this side the Atlantic with growing determination that this country should not be entangled in their strife. All that vast majority believed profoundly that the United States should hold aloof from this war for the same reasons that it had kept out of the previous bloody struggles. The American people can scarcely be blamed that they did not for a long time perceive the real cause of the war—the desire of the German Emperor and his people to win world dominion and establish a German autocracy over the conquered peoples. For no nation, and very few individuals, even among the near neighbors of Germany, at first realized that this was the goal of the Kaiser and his Government. Some of those nations had now and then apprehended danger, but only each one for itself, but upon the fingers of one hand could be counted the statesmen and publicists of Europe who perceived the inten-

tion of world conquest, until the field-gray legions had been started upon the adventure. And those few who had declared such a conviction concerning German purpose had had their trouble for their pains. For no one had heeded their warning. Slowly, as evidence accumulated that convicted Germany out of her own mouth and was surveyed in the light of the event to which it all pointed, did the governments and peoples that were being attacked come to a realization of the truth.

The American people were still longer in understanding the full significance of the purpose with which Germany launched the war. For their knowledge that through many centuries one after another of the European powers had striven through blood and devastation and agony to gain dominance over the others made them for a long time heedless of the meaning of the accumulating evidence and led them, in all honesty and conscientiousness, to absolve themselves of any responsibility or obligation. German propaganda of the most insidious and plausible sort, its sources well concealed, was busy everywhere and, although it had no success in changing the direction of the spontaneous sympathies of the people, it did aid in preventing them from discerning for many months the real cause and purpose of the war.

Moreover, that any nation in the twentieth century should lust for world dominion and should set out to gain it seemed to the average American mind so impossible, so insane a purpose that it was loath to believe the truth. More and more evidence had to be accumulated and pressed home, more and more proof of the satanic methods by which the Germans were seeking to gain both their immediate and their

ultimate ends had to be shown the American people before they could realize the full truth and the full significance of the German purpose. Not until that purpose ceased to stagger their belief did the sense of obligation begin to stir their spirits.

Hardly less universal and profound than the political conviction that this nation should stay out of European entanglements and let Europe settle her own quarrels in her own way was the moral and intellectual conviction that war is a wasteful and wicked means of bringing about any desired result. For more than a generation this belief had been growing and striking deep root in the minds and hearts of the American people. The nation that sprang to arms in April, 1917, was a nation that loathed war from the bottom of its heart.

So powerful and so universal were these convictions, that the country should be kept aloof from European dissensions and that war should be considered only as a last resort in a righteous cause, that no leader could have put the country wholeheartedly into the war until the masses of the people were convinced that the moment had come when they must enter it. And they were not, in their millions, thus convinced until the events near the end of 1916 and early in 1917 had shown them the path they must take. Then it was—and until then it would not have been—a united and determined country that took up the cross of war and faced the ascent of Calvary—how completely and closely united and how sternly determined the pages of this book will try to show.

PART ONE

THE FIGHTING FORCES

SECTION I. ON LAND.

CHAPTER I

THE MAKING OF THE ARMY

THE United States sprang into the greatest war the world has ever known, a war in which men and machines and resources were being consumed in enormous quantities, with an army numbering, all told, only 212,000. The first necessity was to create, train and equip an army that would, at the earliest possible moment, number millions of men and thousands of officers. American sentiment had always been strongly opposed to the principle of compulsory military service and the only attempt the country had ever made to use the draft system, during the Civil War, had caused dissatisfaction, disturbance and riot in civil life and in its military results had been practically a failure. Through many days of discussion in Congress and throughout the country the question was threshed out, while enlistments to the number of over 800,000 were swelling the ranks of the Regular Army, National Guard and Reserve Corps organizations. In the end, there was general agreement that only the draft system could furnish the enormous numbers of men required and draw them

from civil life with democratic justice and with due regard to social and economic interests.

As a large number of foreign born citizens had come here to escape the compulsory military service of their native countries, there were many grave fears of the result and it was even expected that in centers of foreign population there would be riotous demonstrations of protest. But those who were thus apprehensive had not rightly estimated the intelligence, the democracy and the Americanism of the whole citizenship of the country, foreign as well as native born.

The success of the Selective Service Law, enacted by Congress on May 18, 1917, was as spectacular as it was complete. The entire machinery of registration, compilation and report was organized and made ready for operation in the eighteen days following the enactment of the law and was wholly manned by volunteer service from civil life. On June 5th, in a single day, without disturbance or protest anywhere, the entire male population of the country between the ages of twenty-one and thirty, inclusive, went to the registration booths and registered for military service, and practically all the returns were in Washington within twenty-four hours. Two subsequent registrations of young men who had reached the age of twenty-one after June 5th brought the number of registrants up to a little more than 10,000,000 men.

On September 12th, 1918, occurred the registration under the extended age limits of eighteen to forty-five when over 13,000,000 names were added to the list. Thus in a year and a half of war America listed and classified as to physical fitness and occu-

pational and domestic status her full available power of 23,700,000 men. Out of the first great registration and the two small ones supplementing it and from the Regular Army and the National Guard there had been sent overseas at the signing of the armistice, November 11th, 1918, a little more than 2,000,000 men and there were in the United States, ready for transportation to France, 1,600,000. The American Army totaled at that time 3,665,000. A few of those who had gone were in Italy, Russia, or elsewhere, but nearly all of them were in France, trained, equipped and either on the fighting line, in supporting divisions, or waiting in the rear ready for the front. Those in the American training camps were being transported to France at the rate of from 200,000 to 300,000 per month and would all have been overseas by early spring of 1919. The work of classifying the registrants of September, 1918, and of making the selections for military service was already under way and the flow of these men into the training camps had begun. The plans were all ready for operation for calling into military service 3,000,000 more men from this registration, for training them in the American camps two or three months and then sending them to France for a final training period of six or eight weeks. If the war had continued until the next summer, as it was then universally believed it would, the United States would have had ready for service at the front, within two years of its declaration of war, an army of between 6,000,000 and 7,000,000 men, taken from civilian life, trained, equipped and transported across the Atlantic Ocean within that time.

The mechanism by which this army was gathered,

examined, selected, classified and sent to training camps worked as smoothly, as efficiently and as swiftly as if the country had been trained for a century in martial methods. The quotas to be furnished by states, counties and smaller districts were apportioned and local boards were appointed to have charge of the task of calling the selected men, examining and classifying them and sending to the training camps those finally chosen as physically fit for the service and able to serve without injury to dependents or to essential industry.

Registration also had been carried on under these local boards, each registrant being numbered in order. The draft call was made by means of a lottery drawing in Washington where each number that was drawn summoned all the men of the same registration number in all of the 4,500 local boards throughout the country. The local boards called in the men whose numbers were chosen, examined them as to physical condition, considered their claims to exemption, if such were made, on the ground of being the necessary support of dependents or of being engaged in an essential industry, decided for or against them and certified their names to the district board, which acted as a board of review for local boards, as exempted or held for service. If approved for service by the district board, the local board inducted them into the service and sent them to a cantonment or camp to begin their military training. Each of these 4,500 local boards was officered by three men, one of whom had to be a physician. All of them were civilians who worked practically without pay, until, after some months, a small allowance was made for their remuneration. They carried through the ardu-

ous work, frequently entailing many hours per day, in addition to their regular business or professional affairs, which had to be much neglected meanwhile, in order that they might offer this important service to their country at the moment of need. The draft organization, besides these 13,500 local board members, included over 1,000 district board members, medical, legal and industrial advisers, clerks, Government appeal agents, and others amounting, all told, to a compact, nation-wide body of over 190,000.

The democratic ideals of America have never had a more searching trial or a more triumphant vindication than was afforded by the swift and efficient making of this Army of Freedom. Columbia stretched out a summoning finger, saying, "I need you!" and there came to her service millionaire's son and Chinese laundryman, descendant of generations of Americans and immigrant of a day, farmer, banker, merchant, clerk, country school teacher, university professor, lawyer, physician, truck driver, yacht owner, down-and-outer, social favorite—from village and country and town and city they came, representing every occupation, every social grade, every economic condition in the republic. On the democratic level of service to the country they gathered in the barracks and without a whimper or a word of protest the millionaire's son cleaned out stables, the young man reared in luxury washed his own mess kit and served on the kitchen police, and all of them worked at their training and their drill as hard as day laborers from dawn till dark.

Fourteen tribes of American Indians were represented among the soldiers of the National Army, as the forces formed from the Selective Service were

called for more than a year, to distinguish them from the Regular Army and the National Guards. Then all three were merged into the single organization of the United States Army. Among the most efficient soldiers were several regiments of negroes. Every civilized nation on the face of the globe, every language, and every important dialect were represented in the ranks of the soldiers of freedom who carried the Stars and Stripes on the battle fields of France. Through the office of the base censor of the American Expeditionary Forces passed letters in forty-nine languages. Chinese, Syrian and Dane, Persian and Irishman, Japanese and Italian, Latin American and Swede, vied with the New Englander, the Kentuckian, the Texan and the Kansan in loyalty to the United States, in enthusiasm for our ideals and willingness to defend them with their lives. In the September registration men of fifty-two different tongues were listed in New York City. In the first draft men were called and accepted who claimed birth in twenty-two separately listed countries, while a contingent from Central and South America was not credited in the official report to the separate nations they represented and nearly two thousand men from scattered and small countries were lumped together under the designation of "Sundries." But all of them zealously fought for America.

A great many of these foreign-born men already spoke English. And the education of those who did not began as soon as they were inducted into the army and was continued along with their military training. In every cantonment to which came men who did not understand English schools were established in which they were taught to speak, read and

write the language. All the training and all the life around them were in English and this constant association and the daily lessons soon made most of the men fairly proficient.

Along with the training in English went instruction in American ideals, in the reasons why America was in the war and in what the war meant to them individually. The aim was to give to these foreign-born men the kind of training in patriotism and in democratic ideals, condensed into a few weeks, that the American gets by birthright and surroundings. Many, varied and ingenious were the ways by which this was done. There were short talks on war news, on American principles of government, on why America was in the war, on why it was a war for freedom, and similar topics. The special days and the heroes of nations that have their own traditions of revolt against tyranny were celebrated by "national nights" to which came all the sons of that nation in the camp and as many others as could crowd into the auditorium. There were music and speeches and national songs and the hymns of the Allies and in all the talking the speakers would link up American democracy, its mission in the world and the reasons why America was in the war with the traditions of freedom, the heroes of liberty and the sacrifices for democracy and justice of the nation whose celebration was being held. Pamphlets and leaflets, written by men of their own nationality, in English usually, but in their own tongue for those who could not yet read English, which explained the causes of the war, the aims of the combatants and America's motives and outlined American history in a simple and readable way, were circulated among

the men. In a word, these foreign-born soldiers-in-the-making were educated and broadened and so imbued with democratic principles and American ideals that in spirit they rapidly became good Americans, even if they elected to continue citizens of their native land.

But all who wished could be naturalized during their military training. In every cantonment was a court of naturalization and by a special law it had been made possible to shorten the time ordinarily needed for this process. Any man who was going forth to fight the battles of civilization in the American army could become an American citizen, even if he had not previously declared his intention, while he was being trained. In one day at one of the cantonments men of fifty-six nationalities were naturalized. At this camp sessions were held from eight till five o'clock and were often continued until midnight, so many were there who wished to become citizens. The majority of the aliens in the selective service did so choose and the great bulk of the foreign-born part of the huge army that was ferried across the Atlantic had acquired American citizenship. Aliens who did not wish to serve could, and some thousands did, claim, and were granted, exemption on that ground.

Now and then Columbia's summoning finger brought to the training camp a slacker, or a religious or a conscientious objector. Patient and careful inquiry was given to every case and no effort was spared to make sure that each was receiving exact justice. The official report of the Provost Marshal General for the first draft reckoned that out of the more than 3,000,000 called for service no more than 150,000 of

those who failed to appear on time were not accounted for by enlistment, transference or death. The reports of the local boards showed that the bulk of this residue was composed of aliens who had left this country to enlist in their own armies. Out of the remainder of 50,000 a great many of the failures to report were due to the ignorance or heedlessness of workingmen who had moved, between registration and the call, from one job to another in a different locality.

The exemption usually given to religious objectors was extended, after a few months, to include those who based their objections to sharing in warfare upon grounds of conscience even if they were not members of a religious organization. Out of the 3,600,000 men inducted into the service a little less than 4,000 were accepted or recognized as conscientious objectors. A large number of these were assigned to work on farm or industrial furloughs. Some entered non-combatant service and a few were allowed to join the Friends' Reconstruction Unit. Several hundred refused any service whatever and were sent to prison. In the training camps the conscientious objectors were segregated and placed in the charge of an army officer who was often able by tact and persuasion to influence them to a different point of view. Some swallowed their objections very soon, took up the work of training more or less sullenly, and presently, seeing a better light and feeling the influence of the patriotism and enthusiasm surging round about them, became as good soldiers of Uncle Sam as any of their comrades. The problem of the slacker and the objector was a small one in the making of the great army that was sent overseas, but it

was a vexatious one for the honest-hearted men who had charge of it and who took infinite pains to dispense even-handed justice in every case. "My company," said the captain in one large cantonment under whose command were grouped the slackers, the religious objectors and the protesters for conscience's sake, "is the most interesting one in the camp—and the most trying."

Development battalions were established in nearly all the cantonments and did a good work in raising the efficiency of some of the men of the army by helping them to reach better physical condition. To these battalions were sent men who developed minor physical defects and the men sometimes received from the local boards who fell short of the physical standards set by the army. Medical treatment, courses of physical training and, if necessary, surgical operations brought many of them to so much better bodily condition that they could undertake limited service. Many were sent to the forests of the Northwest as part of the regiment that did most necessary work in helping to get out spruce lumber for airplane construction. Others were prepared for clerical and semi-civilian work in the army, thus releasing for active service those who had had it in charge. A goodly number improved so much under treatment that they were enabled to undertake active army service. All told, about 250,000 men passed through the development battalions, of whom nearly half were made fit for duty in either the first, second or third class. Educational work was also carried on in the battalions and many who were either illiterate or had had very little schooling received elementary instruction from former school teachers, of whom there

were many in the ranks. Short talks on the duties of citizenship, phases of American history, public questions, and the causes and progress of the war and the encouragement of discussion broadened the outlook and stimulated the minds of the men.

The necessity of organizing and training a huge army in a few months made equally necessary a revolution in some army methods, a revolution that was brought about by the Committee on the Classification of Personnel appointed early in the war. For most of its work, which constantly broadened and became more and more important, it had no precedents, for, except a little experimenting in the British army, nothing like it had ever been attempted before. In scope and function and purpose it was one of those bold innovations upon army traditions and methods which the Secretary of War introduced into the training of this new army of democracy, with results so successful and important that when the complete story of them is known it will be seen that they put a new spirit into military training and were in no small measure responsible for the splendid record made by the American army.

The Director of the Committee was a civilian, a university professor and specialist in psychology who had won distinction by his ability to give that science practical and fruitful application in daily life. Its work was so varied and so well developed in all its phases that it is possible to give here only the barest résumé of its achievements. By the methods it devised all the men who entered a cantonment, after they had passed their physical examinations, underwent psychological tests to determine the speed and accuracy of their mental actions, the quality of their

native intelligence and the extent of its development. Then they passed on to interviewers who examined and classified them according to their education and training, their occupations and degree of skill. Afterward came trade tests to discover whether or not the men had truly reported their occupations and ability.

These trade tests and the methods of their application, as finally developed, were the result of much work and investigation by the Committee that had brought in the services of psychological experts, employment experts, statisticians and others. Their purpose was to procure a dependable record of the special ability of every soldier who possessed any kind of skill that would serve any one of the army's varied needs. Every army unit must have specialists of several kinds and in an army that had to be built up at high speed it was necessary to find these specialists among its numbers. Bitter experience developed the fact, very soon, that the account of themselves which the men gave in answer to the questions of the interviewers frequently could not be depended on and the trade tests, which were of three kinds, oral, picture and performance, were devised to meet this necessity quickly and easily.

As the soldier passed through these various examinations his interviewers entered upon his record card his physical and mental qualifications, his trade or profession and his degree of proficiency. Thus was tabulated, for the first time in the history of any army in any nation, the exact physical, mental and industrial ability of every soldier in the American army. These records were kept by the unit to which the soldier was assigned, and followed him if he was changed to another, for the information of the offi-

cers under whom he served. A glance at such a card gave to an officer the knowledge he should have concerning the aptitudes, the abilities and the character of any of his men whom he might wish to assign to some particular service. If skilled men were wanted in any of the scores of special occupations which the modern army demands they could quickly and easily be brought together, with the sure knowledge that they would be able to do what was expected of them. One of the greatest of the many problems facing those who had to make an army of millions of men out of raw civilians in a few months was to be sure of getting the right man for the right place, and the Committee on Classification of Personnel, an innovation in the making of armies, solved it.

Similar tests helped to determine the qualifications of officers and enabled their superiors to judge their fitness for any specified duty with accuracy. The Personnel work was conducted by men chosen for it because of their aptitude and their experience in civil life and they were then trained especially for it in schools for that purpose instituted at army camps.

These individual records and the service records of the entire army, both privates and officers, with the history of each unit, are to be preserved among the archives of the Government.

This great army, growing at the rate of a hundred thousand per month, nearly the whole of it composed of civilians who had been entirely lacking in military knowledge and training, without interest in martial affairs and, in large part, averse to the principle of warfare as a means of settling human disputes, had to be trained in the quickest possible time

for participation in the greatest, the most shocking and the most scientific war of all history. The Regular Army and the National Guard together could furnish no more than 9,500 officers, a mere handful compared with the number needed. Beginning in May, 1917, four series of Officers' Training Camps were held, each series lasting three months, at which men studied and drilled with grueling intensity twelve hours a day, fitting themselves for the work of training the Selective Service men who began to be gathered into the cantonments early in September. At these camps were trained, all told, 80,000 officers, from second lieutenants to colonels, although the higher commissions were granted only at the first two series because of the urgent need, at first, for officers of all grades. There were also several special training schools, one for colored officers of the line, and others in Porto Rico, Hawaii and the Philippines. Several thousand officers were trained and graduated also from Reserve Officers' Training Corps units established at over a hundred colleges and universities.

French and British officers and British non-coms were sent by their governments to the United States to aid by giving practical training out of their own experience and their assistance was of great value. After our own men began to go overseas and have training and experience at the front many of them were brought back for the higher importance of the instruction they could give.

From the training camp schools of intensive study and drill many thousands of young men were assigned for work at the special officers' training camps where

VIEW ACROSS ONE END OF A CANTONMENT THREE MONTHS AFTER ITS CONSTRUCTION WAS BEGUN

TRAINING A MACHINE GUN COMPANY

officers were prepared for the specialized duties of the Signal, Engineer and Quartermasters Corps, and for coast and field artillery and machine gun work. Here also there were long hours and steady, close application. From these special training camps 60,000 officers were graduated. A shortened and intensified course at West Point greatly increased the number of its graduates ready for officers' service with the army.

In the autumn of 1918 five hundred colleges and universities became a part of the great program of the War Department. Each of these institutions was transformed into a martial training school and nearly all the men students of the whole five hundred, about 170,000 in all, joined the Students' Army Training Corps, thus becoming members of the United States Army. But while these youths spent much time on drill and training they also were expected to keep up their other studies. For this was a scientific war and demanded for its prosecution men skilled in many branches of learning. The young men were being trained to be not only soldiers but also engineers, chemists, physicians, geologists, physicists, and specialists in many other lines. From their ranks the most promising were selected and sent to military camps for six weeks of a course of rigid and intensive military training in some special line of military service. West Point graduates, army officers with experience on the other side, officers loaned by our Allies, had charge of the military supervision and work of this great body of students. And during the summer of 1918 7,000 members of university and college faculties attended special training camps

to prepare themselves to assist in this work. The school year's training was expected to yield, by the spring of 1919, from 60,000 to 70,000 officers.

Thus, by training, selection, rigid test, more intensive training, the hardest of hard work, and still more training under men who had proved their worth in battle and had brought back dearly won knowledge of present day methods of warfare, the need for more, and more, and ever more officers for the rapidly expanding army was met. And in the camps and cantonments the daily drill, drill, drill, and again drill, drill, drill, of a million and a half of soldiers was constantly carried on.

Early in the course of all these activities it was perceived that it would be advisable to reconstruct the entire plan of organization of the army in order to make the size and number of its fighting units correspond with those of the English and French armies and thus simplify the brigading of our troops with the others and the exchanging of units in the front lines. This reorganization was carried out, as was also the merging together into one body of the three organizations, Regular Army, National Guard and National Army, in the midst of all the high-speeded preparations for war.

Another revolution in army methods, the result of the imperious necessity for the highest efficiency possible to obtain, whether from soldier or officer, individual or army, was the sweeping away of the old system of promotion by seniority. All officers below the rank of Brigadier-General, under these new regulations, had to undergo the passing of judgment upon them every three months by their immediate

superiors. They were rated according to their physical and personal qualities, capacity for leadership, intelligence, and value to the service, and promotion depended upon how well they passed these tests.

CHAPTER II

HOUSING THE SOLDIERS AND THEIR SUPPLIES

WHILE the machinery was being devised and set in motion for forming a great army by means of the selective draft and officers were being schooled for its training, immense camps had to be provided in which hundreds of thousands of men could be trained, warehouses had to be built in which to gather and store the enormous amounts of supplies necessary for their maintenance and equipment, huge plants had to be constructed for the making of certain kinds of ordnance, and included in the vast scheme of construction work, all of it necessary almost at once, were also flying fields, embarkation depots, port and terminal facilities.

The work of building the cantonments was, alone, a very great engineering achievement. It called for an expenditure within three months of $150,000,000, more than three times that of the largest year's work on the Panama Canal, and it demanded the construction of nearly a score of goodly sized cities, to be ready for occupancy by the following September. For this huge job, when war was declared, there was one colonel with four assistants and a few draughtsmen, clerks and stenographers. Around that lone colonel there was built up, almost over night, by telegraph and telephone, the organization

of the Government's Construction Division, that carried through successfully the whole vast program. For the building of the cantonments, engineers, town planners and civilians having expert knowledge came to its assistance, investigating possible sites and studying their water supply, transportation facilities and availability of construction materials. Contracts were let for sixteen National Army cantonments and as many National Guard camps. These were all signed between the fifteenth and twenty-seventh of June and in three months some of them were in use, while in six months all the work had been finished, plus many additions and betterments.

The building of each meant the creation of a city that would house from forty to eighty thousand people. The ground surface had to be prepared, hills leveled, valleys filled, trees uprooted, brush cleared away and roads built. Then began the construction of barracks for the men, officers' and nurses' quarters, hospitals, repair shops, and all the other buildings necessary for the varied activities of the camp, amounting to more than 1,400 separate structures in each cantonment. Sewage systems and steam heating and electric lighting plants were installed. An ample water supply, with plenty of shower baths, was provided, allowing fifty gallons per day per capita, which is eighty per cent more than the average allowance in European army camps. Every care was used to assure the purity of the water. When taken from rivers it was filtered and sterilized.

The total cost of the thirty-two cantonments and camps was $179,607,497. Additions and betterments during the next six months added $22,000,000. Every camp had its garbage incinerator, coffee roasting

plant, theater, repair shop and other buildings that added to the comfort and morale of the men and the efficiency of the camp's work. Such care was taken in the sanitation of the training camps and in the assuring of a pure supply of water—sometimes making necessary the draining of surrounding areas—that the reports of the Surgeon-General showed the practical elimination of water-borne diseases among the troops in training.

Almost as rapid as the work on the cantonments and camps was that which had to provide hospitals, flying fields with all their many buildings for varied uses, huge storehouses and port and terminal facilities. At half a dozen of the Atlantic Coast cities port terminals with warehouses and wharves had been completed or were nearing completion at the end of hostilities unprecedented in size and completeness of equipment in our own or any other country. One storage warehouse provided 3,800,000 feet of storage space and another, for ordnance supplies, had 4,000,000 square feet of space into which were fitted seventy-five miles of trackage and 9,000 lineal feet of wharf frontage.

For the production and storage of certain kinds of ordnance great plants had to be built at the highest speed and, for the most part, because of their dangerous possibilities, in out of the way places where the problem was complicated by the necessity of providing housing not only for the workers who would operate the plant but also for those engaged in its construction. An instance of one of these, and there were many others, was a smokeless powder plant the building of which in eight months transformed farm land along a riverside to a busy

town, containing 3,500 people, into which had gone 100,000,000 feet of lumber. It had rows of barracks for single men, blocks of cottages, other blocks of better residences, huge storage houses, laboratories, manufactories. A pumping and purification plant built among the first of the structures took from the river 90,000,000 gallons of water per day and made it fit for use. While the plant was being erected from 200 to 400 cars of freight were unloaded daily. Construction projects of this class, including plants for the production of gas, nitrate, picric acid, powder and high explosives, presented complicated problems and their cost ran from $15,000,000 to $50,000,000 each. And all were erected and in operation within a few months from the day of the first work upon them.

Eighteen months of war saw the construction of nearly five hundred important projects of these various kinds at a cost of over $750,000,000, all of them rushed to completion at the greatest possible speed.

CHAPTER III

FEEDING AND EQUIPPING THE ARMY

THE Quartermasters Corps, which formerly totaled 500 officers and 5,000 enlisted men, with its facilities and routine adapted to the feeding and equipping of an army of 127,000 men, had at once not only to meet the needs of the vastly expanding forces and to keep abreast of the actual growth and immediate demands of the army as it came into being, but it had also to anticipate and prepare to meet what would be the much greater needs of a much larger army six or eight months in advance.

While a million and a half of men were being examined, classified and called to service and more than thirty cantonments and camps were being built in which to house and train them and other construction projects were being rushed forward, the Quartermasters Corps had to provide their uniforms and clothing and accumulate in storage the food for their subsistence. At the same time, it had to make sure that it could meet the constantly enlarging needs of the coming months when the army would grow like a Jonah's gourd with every passing week. Production had to be stimulated and turned aside from its usual channels and enormous quantities of material used for new purposes. It was an emergency that required the practical making over of the meth-

ods and purposes of American industry and in the process the Quartermasters Corps had to be both the directing and supervising agency and the channel of communication between industry and the army.

A soldier's outfit of clothing for a year cost $65.51 and numbered twenty-three different items of a dozen different branches of manufacturing industry. The initial equipment for one man's shoes alone cost $14.25. During the sixteen months from April 1st, 1917, to the end of July, 1918, the army was supplied, among other things, with 27,000,000 pairs of shoes, field and marching; 29,800,000 pairs of breeches, light and heavy; 19,800,000 coats, both wool and cotton; 192,200,000 shirts, undershirts and drawers, for both summer and winter wear; 156,600,000 pairs of stockings of cotton and light and heavy weight wool; and 21,000,000 blankets. And by the end of July the Corps already was taking measures to provide the clothing necessary during the coming year for the army of 5,000,000 men for which the War Department was preparing. That meant it must have on hand whenever and wherever they should be required, among many other things, all of which at the signing of the armistice it had either ready or in sight, 17,000,000 blankets, 28,000,000 woolen breeches, 34,000,000 woolen drawers, 8,000,000 overcoats, 33,000,000 pairs of shoes, 110,000,000 pairs of stockings, 9,000,000 overseas caps, 25,000,000 flannel shirts.

Ten great storage depots were maintained in as many different regions of the country where huge quantities of equipment were kept and from which the camps in that district were supplied. Other storage plants had to be kept full at the ports of embarkation from which the troops bound for over-

seas service were outfitted. On the other side of the Atlantic stock depots were maintained with complete equipment for ninety days' supply for all the troops, numbering finally over 2,000,000, that were sent overseas. As an indication of the enormous quantities of clothing which had to be sent across the Atlantic, on the first of July, 1918, there were, along with similar large quantities of other supplies, on docks in the United States ready for shipment, 2,700,000 blankets, 840,000 pairs of spiral puttees, 7,500,000 pairs of stockings, 1,400,000 pairs of field shoes, 203,000 pairs of hip rubber boots, 713,000 overseas caps, 697,000 woolen breeches, 709,000 overcoats.

A force of inspectors kept the output of the manufacturing contractors constantly under rigorous watch and whenever supplies were not up to the specified standard they were rejected. Because it is of the first importance that a soldier's feet be always in the best condition, great care was taken in properly fitting each individual. A scientific means was devised of measuring the soldier's foot when he received his first pair of shoes and of testing the fit so that he could be sure of entire comfort in his footgear, no matter what the length of the hikes he should take. And after being perfectly fitted the first time, with each successive pair—each year in the service in the United States he received three pairs and four pairs for each year abroad—he had only to ask for another exactly similar.

The American army has always been a well fed army. In the pre-war days, when it was the smallest army maintained by any large state, experts from other nations, versed in the quantity and quality of army rations, said that the American was the best

fed of all armies. And this was still true during the great war, though its numbers leaped on by magic strides. Whether in training at home, in camp on the other side, or on the battle front, the American soldier had better food and more of it than the soldier of any other nation. For instance, extra rations from American supplies were issued to American soldiers when brigaded with those of any other army, in addition to those supplied by the commissariat of the army with which they were working. No experiments were made upon the doughboy in the matter of food and experts saw to it that his ration was agreeable to the taste, well-balanced and nutritious. That it was good was proved by the fact that the average soldier gained from ten to twelve pounds in weight after entering the service.

Food experts were constantly busy devising the best means of preserving the food until it reached the army kitchens, whether in the home camps or behind the lines at the front. A part of their mission was also to eliminate waste. Coffee roasting plants were installed in all the large camps at home and overseas, for the double purpose of giving the soldier better coffee—coffee made within twenty-four hours after the bean had been roasted—and to prevent the waste, about two cents on each pound, which results when the roasted coffee is kept for long periods and so deteriorates in strength and quality. A school was established to which men were sent to learn the art of roasting coffee properly and after they became expert they were detailed to the different camps at home and abroad to take charge of the coffee roasting plants. Lemon drops were found to be a desirable part of the army ration, as they supply needed fac-

tors of food, help to quench thirst and are much enjoyed by the soldiers. To make sure that the drops supplied should be of the best quality a formula was prepared calling for pure granulated sugar and the best quality of fruit and the candy makers taking the contract were held strictly to that standard. The same care was taken to see that manufacturers of chocolate candies should use the best cocoa beans in making them. The candy ration for troops on overseas service was a half pound every ten days for each soldier, and a great deal of this was made, toward the end of the war, in factories which the Quartermasters Corps established in France.

The American soldier's daily ration consisted of twenty-seven articles of food, weighing altogether about four and a half pounds and costing about 50 cents per man, and it had to be ready for him regularly and promptly every day, wherever he might be. No second grade material of any kind was bought and constant inspection of raw materials, of processes and places, of preparation and of army kitchens kept the food up to the standard demanded. It was bought in enormous quantities and, in order to stabilize prices in all sections of the country, part of the supplies was secured through the Food Administration and the remainder by means of a system of zone buying. During the ten months from September 1st, 1917, to the end of June, 1918, 225,000,000 pounds of sugar were required and from the 1917 crop of vegetables and fruits the army bought and used 75,000,000 cans of tomatoes and 20,000,000 pounds of prunes. From the listed amounts of thirty articles of food demanded for the subsistence for one year of an army of 3,000,000 men, the approximate

size of the American army before the September draft, the following items are taken. They will give an idea of the size of the task which the Quartermasters Corps undertook in the feeding of our soldiers at home and abroad: Fresh beef, 478,515,000 pounds; bacon, 48,000,000 pounds; potatoes, 782,925,000 pounds; jam, 7,665,000 cans; flour, 915,000,000 pounds; coffee, 61,320,000 pounds; tea, 7,665,000 pounds; canned pork and beans, 4,000,000 cases; canned tomatoes, 6,000,000 cases; evaporated milk, 2,992,500 cases; butter, 15,330,000 pounds. More than six thousand different packers supplied the canned vegetables bought for the army in the summer of 1918, approximately 300,000,000 cans, enough to girdle the earth if the cans were laid in line, end to end.

The necessity of conserving shipping space led to the use of dehydrated vegetables, of which the Quartermasters Corps in the summer of 1918 contracted for 16,000,000 pounds. The soldiers of the Ameriman Expeditionary Force received a ration of 16 ounces of pure wheat flour per day each. No wheat saving substitute was used there, for the reason that field bakers must work swiftly and can not afford to experiment with flour mixtures. At the training camps in the United States kitchens were stationary and bakers definitely located and here the prescribed amount of substitutes was used, with satisfactory results. The Subsistence Division of the Corps worked out a special reserve ration for use in the trenches and under first line conditions in France. It was carried in containers proof against rats, water and poisoning in gas attacks. Schools were established for army cooks and bakers, so that

only skilled and experienced men should serve the food from army kitchens.

But the Quartermasters Corps, while it was feeding and clothing the army, did not forget to be thrifty and it instituted and developed a remarkable system of conservation and reclamation that eliminated wastefulness and turned waste products into wealth. It reduced army waste of food stuffs, including bread, cooked meat and bones, to three-fifths of a pound per day per man, a figure much lower than the average waste of the civilian population in the cities of the United States.

Every camp, both in the United States and overseas, had its repair shops where every article of clothing—hats, shoes, overcoats, stockings, leggins, breeches, coats, gloves—that could be made to give farther service was put into shape. In one month in the summer of 1918 more than a million articles of clothing and equipment were repaired. Fats were extracted from garbage, manure was sold, waste materials of various sorts were sold or turned over to one or another army organization that could find use for them. A school was established with a three months' course at which several hundred men were constantly in training to take charge of the repair, dry cleaning and laundry shops of the army and of the prevention of waste in the handling of food in the camps and the reclamation of values from garbage and waste materials.

Out of the importance of this work of reclamation and conservation came the formation of the Field Salvage Service. The members of this Service, after training at a school for this special work, were sent overseas to collect, classify and dispose of the wreck-

age of guns, shells, tools, all the implements of war that strew a battlefield after an engagement, and which, in former wars, would have been considered of no value. The Salvage Service also operated through all our lines, from the front trenches back through the training camps and lines of communication to every base port, collecting worn or damaged articles of every sort, and turning them to some kind of use. Even empty tin cans were collected and tin and solder salvaged.

The Service had in active operation in France at the end of hostilities four depots, twenty shops and sixty-six laundries and disinfectors. Of all the items it received for renovation and repair it recovered 91 per cent. and utilized the remaining nine per cent. for raw material in repair work. The value of its work during the last month of war was estimated at over $12,300,000, or more than $4,000,000 per day.

Under the care of the Quartermasters Corps was developed the Motor Truck Service, which later became a separate Corps—the "Gas Hounds," as it was called both in and out of the army. At the beginning of our participation in the war the Corps had only 3,000 trucks, most of them in bad condition after hard service on the Mexican border. During the nineteen months of war there were shipped to France 110,000 vehicles and 15,000 tons of spare parts, and in mid-summer of 1918 the Service had 2,700 officers and 77,000 men. The Motor Transport Corps became of the first importance as a means of transport of troops and supplies, both in the United States and overseas, but especially so in France. Its work in moving men, munitions and supplies to the front was of such great consequence that it deserves the credit

of having been an important factor in the winning of the war. In order to assure the quantity production that was urgently needed designs were standardized and all branches of the automotive industry united for their manufacture in close coöperation. Training camps were established to provide officers and men for the operation and maintenance of the Service both in the United States and in France and training was given also at several immense base repair shops. The courses varied from two to eight weeks and 15,000 men were in training at one time.

The American army was the best paid of all the armies of the contending nations. The private and the non-commissioned officer received from two to twenty-five times the pay of privates and non-commissioned officers in the British, French, Italian and German armies. Except for the grades of Lieutenant-General and General in the British forces, the pay of the American officers was also considerably greater than officers received in any of the other armies. The payroll amounted to $40,000,000 per month for every million of officers and men abroad, and was almost as much more for the forces at home. The rapid and tremendous expansion of the payroll, coming at the same time that the Quartermasters Corps was, by necessity, greatly expanding and reorganizing its personnel and was undertaking the huge tasks of providing food, clothing and equipment for the army, somewhat demoralized the system of payment for the first year of war effort. But an individual pay card system was devised which simplified the vexatious problem.

The personnel of the Quartermasters Corps expanded from five hundred officers and 5,000 enlisted

men to 9,000 officers, 150,000 enlisted men and 75,000 civilian employees, while the entire Corps was reorganized, several new divisions created and their work specialized, and finally, so enormous and varied were the tasks which came under its supervision that several of them were transferred to other offices of the War Department or new corps were developed to take charge of them. The total expenditures and obligations of the Quartermasters Corps for the war amounted to about $7,000,000,000.

CHAPTER IV

CREATING A MUNITIONS INDUSTRY

SIMULTANEOUSLY with the work of making the new, huge army, of housing and training it, meeting its immediate and preparing to meet its future needs of clothing and equipment, the War Department had to provide, against the time in a very few months when these troops would be at the front, the munitions with which it would fight—heavy and light artillery, machine guns, rifles, automatic pistols, grenades, bombs, gas shells, cartridges, every death-dealing instrument made necessary by modern scientific warfare. And it had not even the facilities with which to make most of them. The few existing plants had to be enlarged, new ones erected, and even the tools for the making of some of the munitions had to be manufactured before work could begin upon the arms themselves. For many years the whole nation had set its face against increase in the army or in the providing of supplies for it in excess of peace time needs. The commercial manufacture of munitions was repugnant to the spirit of American industry, which had never engaged in it to more than a very slight extent. The making of ordnance is a highly specialized form of manufacturing industry and when we entered the war there were in the United States only two large private concerns and six Gov-

ernment arsenals which were versed in its special processes. In the Ordnance Division of the War Department there were only 97 commissioned officers whose training had given them the knowledge necessary to supervise and direct ordnance manufacture.

Conference with our co-belligerents resulted in a scheme of coöperation in the making of munitions which pooled the resources of all the associated nations in raw materials, manufacturing facilities, labor and finished products in order to make more rapid the production by each and all of them of all death-dealing weapons.

America laid out at once a great and thoroughgoing munitions program and the War Department plunged into it and speeded it at a furious pace. New designs were made and tested, new plants constructed and a big organization for the carrying on of the work was built up so rapidly that office forces doubled and trebled in a few weeks and sometimes even within a few days. In the Ordnance Division the officers' personnel increased within a year from 225 to 4,600 and the enlisted from a little more than 800 to 47,500. Scores of technical, scientific, professional and business men left their private affairs and joined the working forces of the War Department to aid in rushing its munitions program. Upward of 16,000 contracts were quickly placed that required the working up into missiles of death of thousands of tons of raw material by hundreds of thousands of workmen. When the armistice was signed there were in the United States nearly 8,000 manufacturing plants employing 4,000,000 persons engaged in the making of ordnance. Manufacturing concerns of every imaginable sort converted their plants to the production of

the direct materials of warfare for the use of our fighting men.

A corset factory was using its plant for the making of grenade belts. A manufacturer of machinery for popping corn was turning out hand grenades instead. A fireworks establishment was making bombs. A typewriter company was furnishing signal pistols. A big radiator works was an important producer of shells. Artillery carriages were being made by a boiler company, a steam shovel company, and an elevator company. These carriages are very complex, each one consisting of from three to six thousand pieces, exclusive of rivets. So many were needed that, notwithstanding all the help from private industry, in order to insure the necessary quantity production the government built for their manufacture twenty-six plants, all of which were in operation in August, 1918. The intricate and delicate recoil mechanism which sewing machine and other companies began early to furnish was also made in these immense factories. In one industrial district alone, that of Pittsburg, not less than 2,000 industrial concerns were busy in September, 1918, on munitions work. They were employing nearly 200,000 men, with a pay roll of $2,000,000 a day, and their war contracts exceeded in value $2,500,000,000. In that month this district mobilized for coöperation to fill an order for prompt delivery of 33,000,000 semi-steel shells. Shell steel was then being produced at the rate of 500,000 tons per month.

Sixteen new plants for the forging and machining of cannon were built by the Government at a cost of $35,000,000. Two siege gun plants and twenty-six plants for the making of gun carriages and recoil

mechanism were completed at a cost, altogether, of $65,000,000. One of the plants for the making of cannon, of which the construction is typical of all, was wholly brought into being after our entrance into the war. Ground for the factory was broken in July, 1917, and in nine months from that date the first completed gun was ready for shipment. The decision early in our participation in the war that our artillery equipment should conform in general to the standard calibers of our war associates made it necessary to alter our existing facilities and create new ones, but the coöperation it made possible resulted, in the end, in a more rapid equipment of our Expeditionary Forces although it delayed somewhat the beginning of our production.

Ordinarily it takes a considerable time to manufacture artillery, big guns requiring two years and lighter ones from six to ten months. We had to create new plants, new tools, new processes. But at the end of the war we had done all this and had produced 5,000 trench guns, 4,900 light and medium guns, 695 heavy guns and 19 railway guns and mounts—more than 10,000 complete artillery units, and a total of 30,880 units had been contracted for. Many gun forgings and completed guns had been sent to England and France and many spare parts had been supplied to our own Expeditionary Forces. At the signing of the armistice an output of about 500 guns a month had been reached. Among them were 155 mm. howitzers, of which we had reached a sufficient production to exceed our own needs and 600 had been sold to France. There were also 7-inch, 14-inch and 16-inch guns, mortars and howitzers mounted on railway carriages that could be moved quickly from place

to place. A 75 mm. field gun and an 8-inch howitzer, each self-propelling and mounted on a caterpillar tractor that could climb hills and knock down trees, were ready to be sent overseas and were the advance couriers of a quantity production in these types that was already beginning. Several kinds of caterpillar tractors of from two to ten tons were designed, produced and put to the serivce of the artillery.

Machine guns became of more and more importance as the war progressed and by the time of the entrance of the United States the demand for them was urgent and prodigious. Their manufacture in the United States was delayed somewhat for the completing and testing of the Browning machine gun, in order to secure a standard gun superior to the older types which could be produced in quantity, and the working out of plans for its manufacture. It soon proved its superiority in the speed and surety with which it works so triumphantly that both the French and British governments asked for whatever surplus over its own needs the United States could give them. The tools for the making of the guns had first to be produced and work that would ordinarily have taken a year was rushed through in half the time. But within a year quantity production of guns had been reached. Of machine guns and automatic rifles we produced during nineteen months a total of 181,662, and during the months immediately preceding the armistice we had reached a monthly production rate more than twice that of France and nearly three times that of England. The production of heavy Brownings began in March, 1918, and by the end of the following October there had been made of these 39,500 and of light Brownings 47,000.

When we entered the war we had only two plants capable of making our own rifles, which were of a different caliber from those of any other nation. One of those factories had been shut down and dismantled and the other, which had been making rifles continuously for the United States for over a hundred years, was producing only twelve hundred rifles per month. The appropriation by Congress for the preceding fiscal year had been for rifles and pistols combined only $250,000. The work was immediately begun of adapting the British Enfield rifle, which was rechambered for our cartridges because they are more powerful than the British and do not jam. But manufacture of this Modified Enfield, Model 1917, was started during the summer of 1917 and over 2,000,000 of them had been produced by the end of October, 1918. During the same time Springfields, which are still used for certain purposes, to the number of 844,000, had also been manufactured, and the Springfield Armory was then producing more rifles in a day than it had formerly made in a month.

To the making of the Modified Enfield rifle go 84 parts and a total of 164 pieces. These parts were all standardized so that any of those made in either of the three large plants that manufactured this rifle could be used in any other. This made possible the rapid rate at which they were turned out. Rigorous tests for each part and close inspection of every process, together with the enthusiastic interest of the employees, made the number of rejected rifles negligible. The employees of one concern, of their own inspiration and desire, adopted the slogan of "one million rifles for 1918" after they had subscribed $1,000,000 to the third Liberty Loan. This plant,

which had under roof more than thirty-three acres, was built in 1915 to manufacture rifles for the British Government, but soon after our entrance into the war signed a contract with the United States. It speeded production so rapidly that by mid-summer of 1918 it was two months in advance of its expected production.

Automatic pistols proved of so much value at the front that General Pershing, as soon as the American troops had got well into the fighting, asked for the supply to be quadrupled and at once numerous private plants began to manufacture them. One firm that had been steadily turning out automatics at the rate of 1,500 per day prepared to double its capacity when the front line needs were made known. Of these and revolvers there had been sent to the front 600,000 up to the end of September, 1918. Of small arms ammunition, including that for machine guns, rifles, pistols and revolvers, American factories produced a total of about three billion rounds. Monthly production had reached a rate of 289,000,000 rounds. The armor piercing, tracer and incendiary bullets used in the Aircraft Service and in anti-aircraft defense were developments of the war and had to be designed for our own guns and to have special facilities for their production.

For the loading of shells four huge government plants were constructed with a combined loading capacity of more than 5,000,000 shells per month. They were larger than any similar plants in the world. One of them covered nearly 3,000 acres and was built and put into operation, from the breaking of the ground, in a little more than six months. For the housing of its employees a town was brought into

existence, within that time, with heating, lighting and power plants, police and fire departments, cottages for families, dormitories with hot and cold shower baths for single men, club-houses, a theater, restaurants, a baseball field and tennis courts. Of high explosive shells of all sizes there had been made, at the end of September, 1918, 2,500,000; of low explosive shells, 3,100,000; of shrapnel, 5,800,000; and of grenades of all types 11,870,000. One grenade factory had established a pace of a million per month.

The tank, which was the answer to the machine gun, was one of the important new weapons evolved by the war, its basic idea having been suggested by the American farm caterpillar tractor, from which a British engineer worked out the formidable engine of battle which it became. Early in our participation the American Government began arrangements for a considerable tank production and experiments and investigations were started to better the design of those in use in the Allied armies. A Tank Corps was formed to have charge of the recruiting and training of the personnel, which numbered thousands of well trained men, but design and production remained in the hands of the Ordnance Department. The United States adopted two types, one the smaller form used by the French Army, of which 4,000 were being made, and the other a modification and improvement of the large tank used by the British, with whom a joint program of tank construction was being carried out when the armistice was signed. Liberty motors furnished motive power, which gave a speed of eleven miles per hour, and each carried a crew of eleven men, two six-inch guns and several machine guns. Some were equipped with wireless.

This huge tank, finished examples of which had been tested and approved, was forty feet long and could climb steep hills, cross trenches and smash down large trees. It would have been taken across the ocean by hundreds during the winter and great companies of them would have plunged into the enemy's lines with the resumption of fighting in the spring of 1919. The component parts of a goodly number had already been made in the United States and sent to England for assembly.

A considerable part of the needs of our co-belligerents for propellants and explosives was being met in the United States when we entered the war and it was necessary that we provide our own supplies without interfering with this production for them. In all, four nitrate plants were constructed or started, and work upon them was rushed as fast as the supply of labor and materials made possible, while extensions and additions were made to existing facilities. Many scientists and technologists constantly carried on experimental and research work upon processes for the fixation of atmospheric nitrogen and other problems connected with the supply of nitrates, and always with the aim in view of developing methods that would have economic as well as military value. The results were such as to make the nation for the first time in its history independent of any foreign country for the charge in the guns of its soldiers and also to bring much nearer the day when the United States would be independent of the nitrate deposits in foreign lands for its commercial and agricultural needs. The toluol for the manufacture of nearly all of the TNT used in loading high explosive shells was recovered as a by-product in the manufacture of

illuminating gas. At the works of twenty-eight gas companies in different parts of the country plants were constructed, placed in the charge of experts and skilled workers and kept under the closest and most vigilant guard for the recovery of this important product, of which hundreds of thousands of gallons were necessary. As a result of the measures taken and rushed through, the supply of propellant and explosive material needed by our war associates was not interfered with and the loading of American ammunition was not delayed.

The hideousness of war was immeasurably increased during the world conflict by the new uses that were made of chemical science. When these new applications of the death-dealing possibilities of chemistry were first made by the German army the civilized world drew back, horrified and appalled. But when a barbarous foe makes savage use of science those who are fighting him must, in sheer self-defense, meet him with similar weapons. Therefore, when America became a belligerent, averse as all her people were to the use of such weapons, regard for the safety of her troops at the front made it necessary to prepare for this peculiarly hideous and detestable form of war. As with other munitions, the industry to produce the implements of chemical warfare had first to be created. The Government built great plants and the immediate need stimulated scientific investigation, with results that were like a tale of magic, so rapidly did these and contributory chemical industries grow.

The American Government did not overcome its reluctance to use toxic gases until we had gone forward several months in war preparations, when it was

found, just as the English and the French had found, that it would have to be done. It was November, 1917, when ground was broken on a Maryland river-side farm for a huge plant that would produce overwhelming quantities of chlorine, phosgene and mustard gas. When the armistice was signed a year later the three hundred acres were covered with vats and kilns, refrigerators, boilers, steel towers, chimneys, pipe lines, railways, and all the other means for carrying on the most deadly manufacturing processes known to man. For much of the machinery needed there were no existing models and many important parts of the immense plant were designed while it was being built. Experts from the French and British gas factories who came to assist in this development saw it rapidly evolve beyond their own knowledge and stayed to learn rather than to teach. Subsidiary plants were built also, and, altogether, American poison gas factories had a total production, during the last weeks of the war, of an average of two hundred tons per day. The British production, speeded to its highest possible point, was never more than thirty tons per day, the French was much less and the German is supposed to have been between thirty and fifty tons per day. Airplanes had been made and successfully tested for the dropping upon German fortified places, such as Metz and Coblenz, of containers holding a ton each of mustard gas with time fuses fitted for explosion a few hundred feet above the forts. Heavier than air, the gas from each container, settling to earth, would not have left a living thing, human or animal, upon, above or under the ground, within or outside of buildings, on a space the size of a large city block.

A new poison gas was developed, far more deadly than any previously in use, and its manufacture carried on with the greatest secrecy. At the end of the war ten tons a day were being produced and it was estimated that a single ton dropped in bombs and containers upon a city of a million inhabitants would have killed them all. Three thousand tons of it were to be ready in the battle zone by March 1, 1919.

Knowledge of these preparations and surety of what would, therefore, happen in the early spring of 1919 are believed by military authorities to have been an important factor in the sudden collapse of the German military plans.

Gas was employed in offensive operations in many and varied ways and these and defensive measures were so important that the necessity for a new division of military activities resulted in the organization of the Chemical Warfare Service in the summer of 1918. Five months old at the end of hostilities, the Service then contained 1,600 commissioned officers and 18,000 men. Defensive measures also had been rushed steadily forward, investigation and experiment had produced a better and more comfortable gas mask than was in use and a big Government gas defense plant had been built, equipped and started upon production with skilled workers. The monthly production of gas masks in the autumn of 1918, of which this plant made the major part, had reached 925,000. The total production for the year and a half was over 5,000,000, with 3,000,000 extra canisters, 500,000 horse masks and large quantities of ointments, antidotes and suits for protection against enemy mustard gas. The American gas mask was recognized

by all the war associates as the best on the Western front.

In the Chemical Warfare Service at the end of hostilities were 1,700 chemists from civil life who had worked steadily to aid in its rapid and efficient development. Under the furious goad of war the Service succeeded in reducing the cost of phosgene gas from $1.50 to 15 cents per pound and therefore increasing very greatly its usefulness in various industries, especially that of dyestuffs. The record of development and production in chemistry is one of the fairly amazing war achievements of this country and is replete with possibilities for the peaceful uses of industry.

When America entered the war, problems and needs rose up at every hand, like dragons springing from the ground, and all of them, in all their number and complexity and variety, had to be met and conquered at the same time. None of them was more difficult than this problem of the creation of a munitions industry, for it demanded a highly specialized manufacturing equipment of enormous capacity and great variety which we did not have, concerning which we had in the past known but little and for which we had always had slight regard. We possessed for it neither the plants, the skilled labor nor the experience. New industrial organizations had to be created and financed, plants had to be built, all the complicated and varied weapons of modern scientific warfare had to be designed and manufactured, and so also did many of the great number and variety of the tools with which they would be made. Not only had mechanics to be trained for much of this skill exacting work, but the enormous expansion in the Ordnance

Department made necessary rapid development of knowledge and skill among the big proportion of its new members. There is nothing more interesting in the detailed story of the munitioning of our army than the frequency with which one comes upon the statement that "a school was established" for the training of personnel in this, or that, or another phase of ordnance duties.

The bare figures of the cost of all this enormous creation and expansion, made many times greater by the necessity of haste at whatever cost, give a vague sort of measuring stick of the energy and the grim purpose that went into the providing of munitions for our army. In a year and a half of war the amount of money expended or obligated for ordnance totaled $13,000,000,000—thirteen times what it cost to run the entire government for a year in the years just before the war.

CHAPTER V

CARING FOR THE WOUNDED

THE story of the development of the Medical Department of the Army, its care of the human wreckage of the battlefield and of the physical welfare of the fighting forces both at home and overseas recounts one of the finest and most wonderful of the achievements of the War Department. It is the same story of marvelous expansion in quick time, of high resolve and determined effort to achieve the apparently impossible, and of results that seem almost magical in their bigness and importance and the rapidity with which they were brought about that is true of all the American war activities.

At the beginning of April, 1917, there were in the Medical Department 750 medical officers in regular service and 2,600 in reserve. The army nurse corps numbered 400 and there was an enlisted personnel of 6,600. There were seven army hospitals with a bed capacity of 5,000, aside from a few small and unimportant post hospitals. A year and a half later it had a larger personnel than that of the entire American army at the outbreak of the Spanish-American war. It numbered then 40,000 officers, 21,000 nurses and 245,000 men. In the United States there were over eighty fully equipped hospitals with a capacity of 120,000 patients and operating with the American

Expeditionary Force were 219 base and camp hospitals having a capacity of 284,000 patients. It was estimated that nearly one-third of the entire medical profession in the Union went into active service with the Army and among their numbers were many of the most distinguished physicians and surgeons in the country. Of those who went overseas, nearly half that number, over 1,000, were detailed to serve with the British forces.

As an instance of the speed with which it was necessary to work to secure the needed expansion for the care of war's wreckage the story of the building of one of the New York City debarkation hosiptals is illuminating. Several acres of ground on Staten Island were secured for it and the entire plant, consisting of eighty-six buildings, including a theater of seven thousand seating capacity, with heating plant and electric light, water and sewage connections, was finished and ready for use within one hundred days from the turning of the first spadeful of earth in the preparation of the site. Its normal accommodation was for 1,500 patients, but it was so planned that it could be easily and quickly expanded to care for three times that number. One of its buildings, measuring 230 by 30 feet, was begun in the morning, finished by noon of the same day, and equipped by night. Hospital facilities in France had also to be created quickly and equipped at once with all the means of treating the victims of scientific warfare that the needs of the time had evolved. One such big institution in the Cote d'Or region, for the building of which railways had to be run to the site and concrete mixers set up and kept going day and night until it was finished, had 600 buildings of a permanent type

and was, in effect, a series of ten hospitals in one, each devoted to its own specialty and having its own staff of thirty physicians and surgeons, a hundred nurses and twice as many men of the Medical and Sanitary Corps, and its own operating rooms, laboratories, kitchens, officers' and nurses' quarters, administration buildings and buildings for patients. A laundry capable of doing the work for 30,000 people served the entire plant. The hospital cared for 25,000 at a time and beside it was a convalescent camp having facilities for all manner of outdoor games with a capacity for 5,000 more into which the men were graduated for recovery. Nearly 800,000 soldiers of the American Army were treated in our overseas hospitals during our war period.

Of the hospitals in the United States a considerable number were in cantonments and camps and were chiefly used by the troops in training. The others, specialized for the use to which they were put, were for debarkation purposes and for the treatment of the wounded, ill, gassed, tuberculous or blinded. Debarkation hospitals received them as they were landed and from these they were transferred to receiving hospitals in and about the port city. Afterward, as soon as physically able, they were sent by hospital boat or train to a specialized hospital, if that were necessary, or if not to the general hospital nearest the patient's home. These specializing hospitals were so located as to secure for each one whatever advantages were possible of situation and climate. Several hospital trains, each complete in itself, with kitchen, dining and ward cars, special beds for stretcher cases, and a car for the medical staff, were provided for transportation of the wounded by land,

while a number of hospital boats properly equipped and staffed with physicians and nurses afforded transportation by water. In addition to the hospitals, convalescents were cared for in numbers of convalescent homes all over the country that were donated for that purpose by individuals and organizations who offered use of their homes, estates, clubhouses and other buildings. The Red Cross erected and staffed convalescent houses at all of the base and general army hospitals in the United States, which gave welcome, cheer and recreation to the recovering patients.

Through the port of New York flowed the main stream of the American Army on its way overseas and there its individual factors had to undergo final physical examination. The work of the Surgeon of the Port expanded from week to week, as his duties in connection with the army and the army transports grew, keeping pace with the increasing numbers that were sent month by month to Europe. In one midsummer month in 1918, and subsequent months saw even greater numbers, he put his final approval of physical fitness on 272,000 soldiers bound for the battlefields of France. On the first of July, 1917, the staff of the Surgeon of the Port of Embarkation, New York, consisted of two officers and one private. A year later there were under him 530 commissioned officers, 110 contract surgeons, 340 nurses and 2,640 men, while directly under his control, exclusive of other hospitals in the same region, were thirteen hospitals having 12,500 bed capacity of which 11,000 were ready for use.

A more than fifty-fold expansion in the number of army nurses, from 400 to 21,000, was necessary to meet the need for their services. Graduating nurses

entered the nurses' corps and an army School of Nursing was established, with headquarters in Washington and branches in a score of military camps throughout the country. Many hundreds of young women enrolled, took the course of training which, intensive and somewhat specialized for army work, prepared them quickly for duty.

The developments of scientific warfare, with its new and fearful weapons of death and its new modes of attack, laid new duties upon the medical profession and new demands upon its knowledge and its methods of healing. It restores one's faith in human nature, after realizing the devilish ingenuity of the death and wound dealing instruments of the world war, to find how incessantly the ministers of healing worked in hospital and laboratory behind the lines to evolve new agents and new methods for the mending of the wreckage from the front. Whatever else may or may not have been won out of the vast destruction of the world war, the medical profession can be assured that its devotion and its heroic labors have been rewarded by a wonderful advance in the frontiers of its knowledge.

The army medical officer found new problems facing him at every fresh development of the conflict, and to fit him for grappling with these new phases of human needs the Medical Department of the Army established numberless schools and courses of study at medical institutions, at hospitals and wherever could be brought together the factors necessary for this specialized and intensive training. Physicians and surgeons in overseas hospitals had evolved a number of new and effective methods for the treatment of casualties of various kinds and medical officers newly

inducted into the service had to have instruction in these developments, while for those who had to undertake recently specialized work it was necessary to have whatever training in that specialty had become possible.

Intensive training and clinical opportunities were provided for instruction in new methods in war surgery and fractures and in the treatment of infected wounds; there were schools for the training of medical officers in the use of X-rays; of laboratory specialists; for special work with diseases of the heart; for treatment of pneumonia and of those infectious diseases that are of frequent occurrence when large bodies of men are brought together. A particularly determined effort was made along preventive lines to lessen in the American Army both at home and in France the menace of venereal disease, always feared for its power to lower the efficiency of armies. Instruction by various means, an incessant campaign of vigilance by specially trained physicians, treatment of infected men, military punishment of offenders, endeavors to control the surroundings of camps, all were among the methods with which this scourge of all armies was combated, with remarkable success. The percentage of such diseases in the Army was below what it is in civilian life and very much below that of its prevalence in the Allied Armies.

One of the schools made necessary by the new methods of training instituted in the American Army was that for the instruction of military psychologists who were needed for the work of examining the men, as they came from their local boards and were inducted into the training camps, in order to eliminate those mentally unfit for army service and grade those

accepted according to their mental qualifications, for the information of their officers, as already described in the chapter on "The Making of the Army." Under the supervision of the Medical Corps, this school trained many officers for psychological work at the cantonments, the course lasting two months. This development, an American idea, was something new in the making and training of armies, but it proved its value in the higher efficiency gained by enabling officers to select for special duties the men best fitted for them and so increasing the efficiency of the fighting units.

A new development of wartime medical science was made necessary by air warfare which soon brought into being the flight surgeon who kept under his observation the men in training at flying fields. So important did this division of the Medical Corps quickly become that special facilities were provided for the training of flight surgeons and laboratories were established for the investigation of the medical problems connected with the air service.

Until the influenza epidemic swept the country in the autumn of 1918, after devastating the populations of Europe, the disease figures of the American Army had set a new low record both at home and overseas. For the year ending with the first of September, 1918, which covered the time from the first gathering of men in the cantonments, the death rate for all troops in the United States was 6.37, which is a lower rate than that in civilian life for similar ages. But when the plague of influenza, which on its way around the world took a toll of 6,000,000 lives, descended upon the camps and cantonments in the United States the death rate rose to 32.15 per thousand. For the en-

tire term of the war the disease death rate was 17 per thousand in the expeditionary forces and 16 per thousand in the army at home. The comparison of these figures with the rate maintained before the passage of the epidemic shows how deadly it was. During the summer months of 1918 the death rate for the troops both at home and overseas fell to 2.8 per thousand. During the Mexican war the disease death rate was 110 per thousand, during the Civil War in the Northern Armies it was 65 per thousand and during the Spanish-American war 26 per thousand. During the last named war the most important cause of death was typhoid fever, before which medical science was then as helpless as it was during this war under the influenza scourge. It had conquered that menace and typhoid, by its precautions, was almost eliminated from our army both at home and abroad. But notwithstanding the devastations of influenza the disease death rate in the American Army was cut to a lower figure than had been reached by any army in previous wars. The lowest previously recorded was that of the Japanese during the Russo-Japanese war, which was 20 per thousand.

The battle death rate of the American Expeditionary Forces was 57 per thousand, considerably higher than it had been in any of our previous wars. In the Mexican war it was 15, in the Civil war in the Northern Armies 33, and in the Spanish-American war 5 per thousand.

Overseas, during the eight months ending with mid-October, 1918, only four per cent of the admissions to hospital because of disease resulted in death. Of the wounded and injury cases treated during the same period a little less than nine per cent

died and over 85 per cent were returned to duty. Of the American Expeditionary Forces 4,000 were permanently crippled and 125 were totally blinded.

The medical officers of all the armies won remarkable results in the quick healing of wounds and the reduction of death from battle casualties by establishing hospital stations immediately behind the fighting lines, regardless of danger. This brave course, together with the efforts of the enemy to annihilate them and their hospitals, caused much loss of life among them. The Medical Corps of the American Expeditionary Forces had 46 killed and 212 wounded in action, and a total of 442 casualties of all kinds.

It was a comprehensive system of caring for the physical welfare of the American troops that was devised and carried out by the Medical Department. It had the fighting man constantly under its eye from the moment of his physical examination for induction into the army until he was examined for his final discharge. It analyzed his water supply, it examined his food and inspected his kitchens, it waged war against flies and mosquitoes in his camps, it made his environment sanitary and it devoted itself to his welfare if he was ill or wounded.

One of the finest of all its multifold and varied works was the scheme for the reconstruction of disabled men and their preparation for a life as useful and successful as they would have enjoyed if unhurt. The principles of occupational therapy were applied to the treatment of ill or wounded soldiers in hospitals, beginning with manual work for the redevelopment of strength and dexterity and continuing with occupational aids for the restoring of the

nervous system and the bringing about of a cheerful outlook. Nurse-teachers were prepared for this work by courses of intensive training, lasting from two to four months. By the time the tide of injured men returning to this country was at its height this reconstruction work was in progress in nearly fifty hospitals, some 700 officers and men of the army had been detailed to serve as instructors and assisting them were 1,200 nurse-teacher aids trained in occupational therapy.

After he had been restored to physical and mental health in the hospital any soldier who was permanently disabled was given the opportunity of reëducating himself, if necessary, in order that he might continue to take a self-supporting part in the work of the world. The nation had pledged itself thus to care for its disabled defenders. With the exception of Canada, the United States was the only country to make this duty, from the first, the affair of the whole people, functioning through the Government. By act of Congress, the work of retraining war cripples was placed in the charge of the already existing Board of Vocational Education, whose agents would get into touch with the disabled men as soon as they arrived from France, tell them that the nation would engage to make them economically efficient again and show them that their rehabilitation depended only upon their own desire and energy. The crippled soldier could choose any line of work, agriculture, industry, commerce, any of the professions, and either add to the training he had previously acquired, or, if it was necessary, undertake a new kind of occupation. There lay before him the possibility of a variety of education that ranged from six

months of shop work to a complete college course of four years. Whatever artificial limbs or appliances he needed were supplied and if he were short of cash a civilian outfit was furnished. Until this training was completed his pay continued at the same rate as during his last month of active service, or it equaled, if this were greater, the monthly sum to which he was entitled under the War Risk Insurance law. Injured men in all branches of the nation's defense who needed this reëducation were made to feel that in no sense were they receiving charity but that the country was only, and gladly, discharging a sacred obligation.

Educational institutions all over the land offered their coöperation and the use of all their facilities in the carrying out of this scheme of re-training and so also did shops and factories and industrial and commercial bodies of all sorts. A few months after the wounded began to return about 13,000 men had registered with the Federal Board for Vocational Education and it was estimated that there would probably be about 10,000 more who would need to share in the benefits of the plan.

CHAPTER VI

THE WELFARE OF THE SOLDIERS

INTO the forming and shaping of the American Army for the World War went something new in the making of armies, something hitherto unthought of in the history of wars, for its training was based upon a new idea, a bold innovation upon military traditions. The method of army training had always been to minimize the individuality of the fighting man, to lessen it to the disappearing point, and so the more surely and easily and completely merge the individual in the fighting mass. Only so, it was believed, could the necessary discipline, unity and uniformity of an army be secured.

But when the United States entered the war and set about the creation of a great fighting force its Secretary of War inspired the task with a new ideal and the whole making of the American Army was based on the idea of developing and heightening the individuality of the soldier, of discovering, improving and utilizing his personal qualities. The unceasing effort was to make of him a better citizen, a better, finer and more capable man, in the conviction that thus he would be also a better soldier. Believing that the higher the grade of the individuals who compose an army the higher will be the grade of the army, all the training, the environment and the treatment of

the soldier, from the time he entered the service until he was discharged, were calculated to develop him physically, mentally and morally as an individual, to inspire him as a person and, in general, to make of him a more intelligent, resourceful, upright, self-dependent, capable and moral man than he was before he entered the army. The immediate purpose was to make a better army, an army of thinking, reasoning units, and therefore an army so intelligent and alert that it would at once perceive the fundamental necessity for discipline and instant obedience and would gain more speedily than by the old method the needful unity and uniformity, while its composite individuals would be more capable of efficient action if deprived by the chance of battle of their accustomed leadership.

That was the first and chief purpose. But behind it lay also the determination that these millions of American young men, the flower of the nation, the beloved of their homes, should be, as far as possible, enabled to preserve themselves from those debasements, corruptions and blights of army life which the world, ages ago, had grown accustomed to accept as inevitable. The purpose was that, so far as foresight and effort could command so unprecedented a result, these young men should bring back no scars or wounds other than those dealt by the enemy. The outcome of this bold experiment was a complete vindication of the vision and the faith of the man who insisted it should be tried.

The preceding pages have shown this purpose of individual development and betterment at work in the methods of training the soldier, giving him at least some measure of education when he was deficient in

that respect, instilling in him the principles of good citizenship, inspiring him with patriotism and enthusiasm for American ideals, broadening his outlook, appealing to his intelligence and ambition, discovering and improving his aptitudes and assigning him to work for which he was fitted. Coöperating with the methods and purposes of the system of military training was a large and varied program of recreation designed to fill the soldier's leisure hours and to work hand in hand with that training to make him at once a better man and a better soldier. A part of this program, that of the Commission on Training Camp Activities, was created by and carried on by the War Department, but many civilian organizations constantly coöperated with it and seconded its efforts.

Within the War Department the Commission on Training Camp Activities—it had its twin in the Navy Department—was appointed by the Secretary of War to provide for the men in training such a comprehensive recreational and educational program as would entertain their leisure hours, stimulate and develop their faculties and better their morale. The Commission, with its representatives in every camp, aimed, as one of its purposes, to make the American army a singing army. Trained musicians and song leaders developed and encouraged vocal and instrumental ability and aided in the forming and training of bands and singing groups. As much music as possible was brought into the daily life and work of all the camps.

An athletic director in each camp organized sports and in consequence baseball, football, cross-country running and other competitive games were of frequent occurrence. Skilled instructors in boxing,

wrestling and other such personal sports improved the resourcefulness and the physique of the men. Every large camp had its Liberty Theater seating from one thousand to three thousand men, built on modern lines and equipped for any ordinary performance. Theater managers and dramatic directors and coaches wearing the khaki of Uncle Sam's service brought to the task of entertaining the soldiers and developing dramatic ability among them the knowledge and the skill gained by years of study and practical experience. Theatrical attractions of every sort, vaudeville, drama, moving pictures, musical artists, entertainers of varied kinds, made the tour of these theaters and plays were given in them by amateur companies formed among the men in the camps.

Educational work of such varied sort was constantly carried on as part of the program of the Training Camp Committee as to give to much of the leisure time of every camp almost an academic atmosphere. The machinery of the university extension work and of the educational department of the Y. M. C. A. was utilized to provide for those wishing to take them a wide variety of college and commercial school courses. English was taught to those of little education and to those of foreign birth. Every camp had its classes in French. There was instruction in subjects which would prepare men to transfer from one branch of the service to another. And always and everywhere there were schools or classes or courses of study for intensive training in one or another phase of military affairs—training for those who would have to undertake these specific and varied duties, training for those who would instruct others in them, training for officers. Every camp and

cantonment buzzed with these activities by which the men of a nation unused to military affairs and hating war zealously trained themselves for battle and schooled themselves in new methods of warfare.

The Commission on Training Camp Activities went vigorously into the work of education in social hygiene and the enforcement of law in order to make and keep the camp environment, the camps and the men themselves morally wholesome, to the end that the army should be of the best fighting material and that the men who composed it should return to their homes as fine and clean as when they left. A determined and unceasing effort was made to keep alcohol and the prostitute away from the cantonments. Wide zones in which the sale or gift of alcohol to soldiers was forbidden surrounded each training area. One section of the Commission dealt directly with the problem of woman and girl camp followers and sought to lessen this evil by work among the women themselves, by securing better enforcement of local police regulations and by educational and reformatory work in camp communities. A great educational program was carried on by the Government by which instruction in sex hygiene was given in the training camps. During the first six months of cantonment training more than a million men were reached in this way, and the work was continued with equal energy throughout the war period.

A system of government insurance, provided by act of Congress and taking the place of the old-time pension system, enabled any member of the fighting forces of the United States to insure himself against death or total permanent disability at a low premium, which was taken from his monthly pay. At the end

of hostilities 4,000,000 of these insurance policies had been taken out by officers and men of the Army and Navy, totaling over $37,000,000,000. Most of them were for the maximum amount of $10,000. Arrangements were made that would enable each holder of a policy to continue it, if he so desired, after leaving the service. Allotments of pay which could be made directly to dependents and allowances paid by the United States to the families of men in service, if such allowance was necessary, helped to relieve the mind of the soldier of worry as to the welfare of his loved ones.

Unique in all history and an integral part of the War Department's purpose to make army service become a means of personal development and betterment for every individual soldier was the extensive educational scheme for the Expeditionary Forces in France. The War Department and the Army Educational Commission of the Y. M. C. A. coöperated in the devising and carrying out of this plan, which enabled the officers and men of the American Army in France to continue their school, academic, technical or professional training while in camp. Worked out and put into operation in the summer of 1918, when the armistice was signed some 200,000 men, chiefly in the Service of Supply, had already begun studies of various kinds, but the scheme did not reach full development until some weeks later.

As finally established in the winter of 1919, this educational plan ran the whole gamut of mental training, from learning to spell to post-graduate work in science, art and the professions. In the Army of Occupation there were compulsory schools for all illiterates, but otherwise the work was optional, and

INTERIOR OF A CANTONMENT LIBRARY

took the place of part of the hours of daily drill. Post schools were established for units of 500 or more men, and generally there were forty such schools for each division. Enrollment at the post schools ran as high as 2,000 and more. Correspondence courses were arranged for men with smaller isolated units. In each army division a high school gave both regular and vocational courses.

Located at Beaune, in the Cote d'Or region, where the huge base hospital had been built, in the great series of buildings no longer needed for trainloads of wounded men was the "Khaki University," at which were given academic, agricultural, professional, commercial and technical courses of three months each. Of its many buildings four hundred were used for class room purposes and others were converted into laboratories, dormitories, libraries and recreation halls. Fourteen colleges comprised this Khaki University which, including the agricultural college associated with it but located elsewhere, became for the time of its existence the largest educational institution in the world. Its colleges gave instruction in language, literature, philosophy, science, fine and applied arts, journalism, education, engineering, music, business, medicine, and all other subjects usually provided for at educational institutions of every sort, whether technical, academic, commercial or professional. Especial attention was paid to agriculture. The engineering school offered a full variety of courses in civil, electrical, mining, mechanical and sanitary engineering. The college of arts, with an art training center near Paris, had 1,000 students and gave instruction in architecture, sculpture, painting, interior decoration, town planning, industrial art,

landscape gardening, and furnished guidance for the study of art museums and structures of esthetic value. In the libraries of the Khaki University were 500,000 volumes. Its faculty numbered 500 members and 15,000 men, all of them privates and officers of the A. E. F., enrolled when the institution opened. The Y. M. C. A., whose Army Educational Commission had devised and organized the entire huge educational scheme, turned it all over to the War Department in the spring of 1919.

Many of the faculty members of important universities and colleges in the United States aided in the working out of this comprehensive educational plan and, under the direction of the Army Educational Commission of the Y. M. C. A. and army officers, coöperated with them in the immediate supervision of the schools. Nearly 50,000 officers and men whose record cards showed them to have been school teachers or university or college professors before they were soldiers were detailed from the army for the work of teaching this huge body of pupils in the post schools and at Beaune.

French and British universities and colleges threw open their doors for those who were prepared to undertake collegiate and post-graduate work. With the Sorbonne leading the list, thirty French institutions offered lectures and courses of study, while at Oxford, Cambridge, Dublin, Liverpool, Manchester, St. Andrews, and elsewhere in the British Isles a welcome awaited the American army man. Furloughs were granted to officers and enlisted men for this work and during the latter part of the winter and the spring of 1919 2,000 worked at British universities, filling to the last one the possibility for their accommodation, al-

though four times as many had applied for the privilege. As many more attended the Sorbonne and other institutions in Paris, while the provincial universities and colleges of France had also their quota.

Solicitous for the welfare of the Expeditionary Force and determined that its members should not fall below the high standard it had established of individual worth and soldierly quality, the War Department met the problem of leaves of absence in a strange land by establishing "leave areas" in especially interesting sections of France wherein was offered a varied program of rest, change, recreation and entertainment. More than a dozen famous resorts in the Alps, the Pyrenees, along the Riviera and elsewhere were leased in whole or in part and put in charge of the Y. M. C. A., which saw to it that the men on leave had a thoroughly good time. Once in four months each soldier in service was entitled to a week's outing at whichever one of these leave areas he preferred to visit. Beginning in the winter of 1918, during the first year of the operation of this system 220,000 soldiers were thus given an opportunity for recreation and sent back to their duties wholesomely refreshed.

Several civil organizations coöperated with the War Department in work for the welfare of the soldier in training and overseas and very greatly aided the Government in its effort to enable the men who composed the army to return to their homes better and more capable men than they were when they left upon their country's service. These and their activities are described in more detail in the chapter on "Big Brothering the Army." But here the Young Men's and Young Women's Christian Associations, the War

Camp Community Service, the Jewish Welfare Board, the Knights of Columbus, the Salvation Army and the American Library Association must be referred to briefly because of the very great importance of what they did for the welfare of the American soldiers and because of their influence upon the character of the American Army.

More than five hundred service buildings were operated by these organizations in the various camps and cantonments in this country alone, and many hundreds more overseas. They furnished to the men wholesome club life, in comfortable houses, with music, games, lectures, reading and writing facilities and athletic equipment. The Young Women's Christian Association built, furnished and officered at least one hostess house in every camp, wherein the women relatives and friends of the soldiers could meet them in homelike surroundings. The American Library Association installed in the camps specially designed buildings, manned them with trained workers and provided many thousands of volumes which were kept in constant circulation.

The War Camp Community Service worked in the localities surrounding the camp, where it aided the citizens in efficient expression of their universal spirit of hospitality and friendliness toward the troops, maintained clubs for soldiers on leave, provided information bureaus, recreation and entertainment, and, in general, helped to create and preserve between the men in training and the community in which they were located a normal and helpful social relationship.

So, in a year and a half, America expanded her army of 212,000 into an army of 2,000,000 men overseas, a million and a half in training, and two million

more preparing, as these latter were sent across the ocean, to take their places in the cantonments. She turned this democratically chosen material from raw civilians of peace-loving traditions into gallant fighters and fused a heterogeneous mass of nationalities into a solid body inspired by and fighting for American ideals. It was an army so eager to get into the struggle for liberty and justice against militarism and autocracy and its spirit was so high and unanimous that every regiment leaving a cantonment for overseas service celebrated the coming of its orders with enthusiasm and was envied by all those not yet chosen. It was an army that, above everything else, was the expression of the mind, the heart and the soul of the American people. Almost every home in the nation had some part in it and it went upon its war adventure with the prayers, the blessings, the love and the ardent wish to serve its needs of the whole people. Never was an army sent to war so fathered and mothered, so big-sistered and big-brothered, so loved and cheered by an entire nation and provided for by its Government with such care and far-seeing vision as this that sailed from the ports of America for the battlefields of France.

CHAPTER VII

MAINTAINING THE ARMY IN FRANCE

TO receive, care for and handle the army in France made necessary prodigious works that, like everything else in the prosecution of the war, had to be planned and executed at the highest possible speed. While the making of the army, the building of cantonments, the development of flying fields, the creation of an industry for the supplying of munitions, the building of shipyards and ships, the expansion of the navy, and all the multitude of wartime tasks to which the nation at once turned its energies were being pushed breathlessly forward, a vast development of facilities had to be begun and carried on in France before our army and its supplies could even be landed upon French shores and transported to the front.

The chief ports of France were already being utilized to their utmost capacity by France and England, and for either of these nations to give up any portion of the port facilities they were using would have meant a serious detriment to their war effort. Therefore it was necessary for the United States to develop sufficiently for our needs the smaller and more backward harbors and port towns. Our shipments of troops and supplies began to land in France at the end of June, 1917, and at once the ports it was pos-

sible for America to use became badly congested because of the lack of unloading facilities. In response to the sore need of our war associates and their urgent request our khaki-clad men were sent over in a constantly increasing stream that grew month by month to ever larger proportions. With each 25,000 men it was necessary to dispatch simultaneously enough supplies of every sort to maintain those men for four months. And at the same time had to be shipped the varied kinds and immense amounts of material for the development of the ports, the building of storehouses, the making of camps, the providing of railways and rolling stock, and all the rest of the work to be done.

As the vessels carrying all these war necessities crowded into the small and undeveloped French ports in the summer of 1917 they had to wait their turns at the docks. It often happened that a ship would discharge the most needed part of its cargo, give up its place to some other ship which also carried sorely needed supplies and wait for another turn to land the rest of its load. Sometimes, so great was the congestion because of the lack of berthing and unloading facilities, a ship would find it better, rather than wait for another opportunity, to return to the United States with part of its original cargo still aboard, reload and cross the ocean again, when it would appear at the French port by the time its next turn came around.

By the following summer, a year after these things were happening, so enormous were the developments and improvements this country had made, that with 250,000 and sometimes even 300,000 soldiers per month pouring into the French ports, with all the vast amounts of food, equipment, clothing and muni-

tions for their use that went in with them, and with all the huge and varied quantities of construction material also being landed, the port facilities were equal to all needs and docks, warehouses and unloading machinery were ready for the still greater demands upon them which would presently have followed if the war had not come to an end.

A great part of the material for this development had to be shipped from the United States, as well as the tools with which the work was done. The piles for the building of the docks, the lumber for the barges on which to place the pile drivers, the material for long blocks of storehouses, the rails and cars and locomotives for the making and operating of hundreds of miles of track, lumber for the building of barracks for the thousands of workmen, dredges, cranes, steam shovels, tools and materials of every sort—almost all had to be shipped from the United States and unloaded at the small, congested French ports, which were being enlarged and developed all the time that this work of unloading was going on in the cramped and crowded space.

In all, more than a dozen French ports were used by the American Government and in each one more or less expansion and development had to be done to make it serviceable, and in all the more important ones a very great amount of development work was instituted and carried through at breakneck speed. So much was done that through the last months of the war it would have been of little strategic value to the Germans if they could have gained possession of the Channel ports of France, for which they had striven mightily in order to cut off communications between England and the British armies in the field,

ONE OF THE DOCKS IN A FRENCH PORT DEVELOPED BY THE UNITED STATES

for by that time there was room for them also at the more southerly ports. St. Nazaire was opened first and was followed by Bordeaux, Brest, Le Havre, La Rochelle, Rochefort, Rouen, Marans, Tonnay-Charente, Marseilles and others.

St. Nazaire, through which poured immense numbers of American troops and vast quantities of supplies, in the early summer of 1917 was a sleepy little fishing village with a good natural harbor which was used only by occasional tramp steamers and coastwise shipping. The berthing and unloading facilities were meager, small, old and dilapidated. The harbor basin was dredged and enlarged, piers were built affording three times the former berthing capacity, the unloading facilities were mutiplied by ten. At Bordeaux, in June, 1917, there were berths for seven ships and no more than two ships per week could be unloaded. Dredging and construction made it possible for seven ships at the existing pier to discharge their cargoes at the same time and inside of eight months docks a mile long, which the French told the American engineers could not possibly be finished in less than three years, were built on swampy land, concrete platforms, railroad tracks, and immense warehouses were erected and huge electric cranes were set up for lifting cases of goods from ships to cars. Approximately 7,000,000 cubic feet of lumber were used in this construction, nearly all of it shipped from the United States. In less than a year it was possible to unload, instead of two ships in a week, fourteen ships all at the same time. The amount of development, of dredging and construction, that had to be done at these two ports alone indicates the size of the task which awaited the United States Gov-

ernment overseas before our men and their supplies could even be landed in France.

There were very few supplies available in Europe for the American Army. Practically everything for their maintenance had to be shipped from the home base, and no chances could be taken with the possible cutting of the line of supply by enemy operations at sea. Therefore, for every soldier sent to France there went an amount of food and clothing sufficient to meet his needs for four months—an immediate supply for thirty days and a reserve for ninety days. The supply was kept at that level by adding to the amount already sent, with each fresh unit of 25,000 men embarked from America, the increase needed for them. As our Army overseas grew to 500,000, to 1,000,000, to 2,000,000, and with each new leap of the numbers subsistence and clothing for their four months' use also crossed the ocean, great cities of warehouses sprang up, almost overnight, for the storing of these immense quantities of goods. Each port had its base supply depot a few miles back from the shore where were stored the materials as they were unloaded from the ships. Here was kept, in the depots of all the ports, a part of the reserve sufficient to maintain the entire Army, whatever its size at any given time, for forty-five days. Well inland, midway between the base ports and the front lines, was another series of warehouse cities to which the goods were forwarded from the base warehouses and from which they were distributed to the final long line of storage depots immediately behind the battle zones. In the intermediate warehouses was kept constantly a thirty days' supply for all the American forces in France and in the distributing warehouses behind the

front and at hospital, aircraft and other centers of final distribution there was always on hand a sufficient supply for fifteen days. Most of the material for all this vast network of storage houses had to be shipped from the United States. This was especially true of the base supply depots and the early construction. Later, much of the wood was cut by American engineering troops in French forests. Let two or three of these warehouse cities afford an idea of the immensity of the task of housing the supplies for our armies.

At the St. Nazaire supply depot nearly two hundred warehouses afforded 16,000,000 square feet of open and covered storage. Back of Bordeaux there was wrought in a few months a transformation from miles of farms and vineyards to long rows upon rows of iron and steel warehouses, each fifty by four hundred feet and affording, all told, nearly ten million feet of storage. At Gievres, what was a region of scrub growth upon uncultivated land became in a few months an intermediate supply depot of three hundred buildings, covering six square miles, needing 20,000 men to carry on its affairs and having constantly in storage $100,000,000 worth of supplies.

These and all the other depots had to have their barracks for the housing of the thousands of men for their operation. In each one a sufficient supply of pure water had to be developed, for nowhere in France was there enough wholesome water for American needs. Usually either artesian wells were sunk or existing sources were enlarged and purified, and reservoirs, tanks and piping were installed. One waterworks and pumping station had a capacity of 6,000,000 gallons a day. Let a supply depot at which

8,000 enlisted men were employed illustrate them all. Rows of neat, two-story barracks housed the men and a huge mess hall, which served also as church, theater and entertainment hall, accommodated 3,100 men at a sitting and allowed 6,200 to dine in an hour. Planned on scientific principles, its overhead service, from which the food was heaped on the mess kits of the doughboys, enabled them to pass quickly in an unbroken line from the serving stations, of which there was one for each company, to the dining tables. Four smaller dining halls seating 500 each added the accommodations necessary for the entire camp. The food was cooked in two large, concrete-floored kitchens, each 312 by 60 feet and having thirteen big stoves, and in two smaller kitchens of three stoves each. An underground sewer carried the camp refuse to the sea, there were plenty of hot and cold shower baths and the whole was lighted by electricity.

At all large supply stations and permanent camps there were huge bakeries, each baking thousands of pounds of bread every day, coffee roasting and grinding plants—one of these prepared 70,000 pounds of coffee per day—ice and cold storage plants that made their own ice, of which one had a daily capacity of 500 tons of ice and held 6,500 tons of beef, big vegetable gardens cultivated by soldiers temporarily unfit for duty at the front, hospitals, nurses' and officers' quarters.

Within a few weeks after our entrance into the war, and before the first troops had sailed for France, a railroad commission was at work there studying the transportation problem which would have to be solved and preparing for the huge organization which would have to be set up before we could give efficient aid.

At first the American Army was simply a commercial shipper over French lines, then American cars and engines were sent over and operated by American personnel on the French roads, under French supervision, and a little later most of the American lines of communication were taken over by the American Army. And hundreds of miles of railroads and switches were built and operated at terminals, between base ports and supply depots, in the supply stations, at the front, and between camps and other centers.

At first American locomotives were shipped in knocked-down parts and set up again after their arrival in France. But this method consumed too much time, when time cost high in human life and treasure. A hurried search was made for ships with holds and hatches big enough to receive such burdens. The first ship that went thus loaded carried thirty-three standard locomotives and tenders tightly packed in bales of hay. Each one was lifted from the rails beside the dock by a huge derrick, as easily as a cat lifts a kitten, and on the other side was lifted from its place in the hold to the rails, ready for express service to the front, in forty-six minutes. In all, 1,500 locomotives, either knocked-down or ready for service, were transported and 20,000 freight cars were taken over in knocked-down parts and erected again at a big assembling station. There were constructed 850 miles of standard gauge railroads for needs which the existing French railways did not meet, of which 500 miles were built in the last five months of the war. In addition, there were constructed 115 miles of light railway, while 140 miles of German light railway were repaired and made fit for operation. In order to carry our own lines across French roads

without interfering with traffic it was necessary to build many miles of switches and cut-offs. Americans operated 225 miles of French railways. The transportation system made use also of 400 miles of inland waterways on which hundreds of barges towed by tugs sent over for that purpose carried army supplies. This entire huge transportation system was planned, developed, operated and manned by American railroad men, from railway company presidents and general managers to brakemen, and required the services of more than 70,000 men.

The aviation program called for big construction works in France, where seventeen large flying fields, divided into several air instruction centers, were developed. One of these aviation centers covered thirty-six square miles and was a city complete in itself, as was each of the other centers, with their barracks, dining halls, hangars, repair and assembly shops, hospital, officers' and nurses' quarters, welfare buildings. And all of these complete, self-contained cities, each housing thousands of people, grew in less than a year upon farming lands.

Hospitals were built upon a standardized system that could expand the number of available beds by from one thousand to five thousand in one day. When the armistice was signed there were in operation 219 base and camp hospitals and twelve convalescent camps and the hospital service was ready to provide a total of 284,000 beds. One of these hospital centers, the huge institution at Beaune, afterwards utilized by the "Khaki University," was constructed in a few months, its 600 buildings of a permanent type including the necessary operating rooms, laboratories, administration buildings, officers' and nurses' quar-

ters, and buildings for patients for a series of ten hospitals, each devoted to its own specialty and having its own staff of surgeons, physicians, nurses and men. For the building of this hospital center railways were run to the site and concrete mixers set up to provide the material, and work was kept going at high speed day and night until it was ready to receive patients.

Hundreds of construction projects were constantly under way for the housing, care, training and welfare of the army whose numbers were growing by tens of thousands every week and would in a few months more have amounted to four million men. There were receiving camps of tents and wooden barracks and dining halls and welfare structures, each of which had its water works and electric lighting and sewage disposal plants, for the debarking men; training camps; schools for the instruction of cooks, chauffeurs, Salvage Corps workers, Tank Corps men, candidates for the Engineering Corps, cavalry officers, coffee roasters, statistical officers, trench artillerymen, and for scores of other specialties in fighting and in caring for the fighting men, by intensive work through long hours every day; nearly a hundred factories in which were made candy, chocolate, crackers, hard bread and macaroni and coffee was roasted and ground, by which much tonnage was saved per month and costs were reduced; huge salvage and repair work; big laundry and sterilizing plants in one of which more than half a million pieces were washed or sterilized per week; motor truck depots and reconstruction parks—one of these latter transformed in two months from a thousand acres of farm land into a great motor plant with shops of

steel and concrete covering 125,000 square feet, railways and switches, storehouses and offices; and dozens of other structures and developments in which great buildings had either to be erected or leased and adapted to new purposes.

Upon the shoulders of the Engineering Corps of the United States Army fell the task of achieving this miracle of construction and development in France. At our entrance into the war it consisted of 256 commissioned officers and 2,100 enlisted men, in seven organizations. A year and a half later it had expanded to 9,000 officers and 255,000 enlisted men, in 309 organizations of which each did a specialized kind of work. A quarry regiment got out stone from French quarries; forestry regiments, under the permission and supervision of the French Government, went into French forests and cut down trees, set up saw mills and carried on lumbering operations in order to help supply the immense lumber needs of our construction projects and so lessen the pressure upon the shipping service; highway regiments repaired roads and built new ones; railroad regiments laid hundreds of miles of railway track; a camouflage regiment composed of architects, painters, sculptors and engineers protected and disguised army operations and ran a factory for the making of camouflage material; map-making regiments printed maps immediately behind the battle lines; others developed water and electric power and installed plants for our manufacturing necessities in more than three hundred localities; still others dug trenches and tunneled under the enemy's lines and built bridges in the rear of the fleeing foe for the immediate passage of American troops in pursuit; and

sometimes they threw down picks and shovels and with hastily seized rifles and bayonets showed themselves to be as good fighters as workers.

All this vast and varied achievement in France, of which it is possible to mention here only illustrative parts of a mere outline, was made possible by the big, closely knit and smoothly working organization of the two branches of the A. E. F., the Army and its Service of Supply. At the head of it all, organizer and administrator as well as soldier and general, was General Pershing, Commander in Chief. Under him the five great divisions of General Head Quarters,—the section that saw to it that all the needed elements of warfare, men, munitions, supplies, and materials for construction, were landed in France; the section that received and distributed all these elements; the section that trained the personnel of every sort; the sections that operated the troops and secured information concerning the enemy and safe-guarded that concerning our own affairs,—carried on each its own work in a great, widely ramifying organization, systematized and highly organized down to its last detail. Running all these organizations on business principles, in addition to the army officers who directed the phases dealing with combat, were successful business and professional men from private life in the United States who gave up big salaries and important positions to work for their country in France on the pay of an army officer. Among them and spending twelve, sixteen, even twenty hours out of the twenty-four on the job of speeding each his own particular work to success were engineers of international renown who had put through mighty projects of bridging and dam-

ming rivers, building railroads and tunneling the earth, experts in financial law, in mechanics, in construction, in finance, manufacturers of automobiles, leaders in steel industries, organizers of big business, officials of important railway companies.

CHAPTER VIII

AT THE FRONT

WHEN Americans endeavor to estimate the value of their work on the lines of battle they are bound to see and should be glad in justice to admit that our actual fighting effort was small indeed compared with the vast and bloody and appalling struggles in which our war associates had almost exhausted themselves. They are bound to see that its importance in the final decision was incommensurate with the amount of what they actually did on the fighting lines, although not, perhaps, with the extent of the nation's preparation. It fell to America to add the deciding strength after years of battle in which the combatants had been so nearly equal that their armies on the Western front had swayed back and forth over a zone only a few miles in width.

Nevertheless, no just summing up of the last year of the war can fail to award to America the credit of having been the final deciding factor, a credit that belongs alike to the valor and size of her armies, the ability of their officers and the overwhelming might and zeal with which the whole nation had gathered itself up for the delivery of the heaviest blows in its power to give. The rapidly growing evidence of how powerful those blows would be, as shown by our enormous preparations in France and the war

spirit and war activities in the United States, had convinced the enemy that unless he won decisive results by the autumn of 1918 there was no possibility of his final victory. And therefore he put forth his supreme efforts during the spring and summer of that year. The enormous scale upon which this country entered upon and carried through its preparations for war both at home and in France sent to high figures the money cost of the war to the United States, but it made immeasurable savings in human life, for anything less would have meant more months of war, even more bloody than the preceding years.

The enemy's determination to win a decisive victory in the spring or summer of 1918 before, he believed, it would be possible for the American Army to make itself felt at the front forced England and France and Italy to make what would have been, without our help, their last stand. They had reached the limit of what they could do and were fighting "with their backs to the wall." Exhausted by nearly four years of bitter struggle they were almost but not quite strong enough to withstand the final, determined, desperate rush of the foe for which he was gathering together all his powers. And American forces gave the aid that was needed to drive him back.

Of high importance among the things that America did to help bring about decision between the battle lines was her share in the final agreement upon unified control of the associated armies in France. It was the voice of the United States Government through its representation in the Supreme War Council that carried the day for this measure and led to the appointment in March, 1918, of Marshal Foch as Gen-

eralissimo of the Allied and Associated Armies, an action which military authorities are agreed should have been taken long before and which, when finally brought about, was fruitful of the best results.

The aim of the War Department, as carried out by General Pershing, Commander in Chief of the American Expeditionary Forces, was to make the American Army in France an integral force, able to take the offensive and to carry on its own operations, and with that end in view he shaped its training and planned for its use at the front after its arrival in France. While he offered and furnished whatever troops Marshal Foch desired for use at any part of the battle line, General Pershing refused to distribute all his forces, insisted upon building them up as they became ready for the front into a distinctive American Army—at the signing of the armistice the First, Second and Third American Armies had been thus created—and by the time the American forces had begun to make themselves felt at the front he had substituted American methods of training, finding them better adapted to his men than the European, and in his last battle, the decisive action in the Meuse-Argonne region, his staff work was all American.

The plan of training carried out, except in the later months when the demand for troops at the front was immediate and urgent, allowed each division after its arrival in France one month for instruction in small units, a second month of experience by battalions in the more quiet trench sectors and a third month of training as complete divisions. When the great German offensive began in Picardy in March, 1918, General Pershing had four divisions ready for

the front and offered to Marshal Foch whatever America had in men or materials that he could use. None of the Allied commanders believed that men so recently from civilian life could be used effectively in battle and it was only General Pershing's knowledge of the character of his men, his insistent faith that they would make good under any trial of their mettle and his willingness to pledge his honor for their behavior under fire that induced Marshal Foch to accept his offer.

Brilliantly did these men justify their commander's faith in them in this and in all the later battles in which they took part. In all, 1,390,000 were in action against the enemy. Less than two years before they had been clerks, farmers, brokers, tailors, authors, lawyers, teachers, small shop keepers, dishwashers, newspaper men, artists, waiters, barbers, laborers, with no thought of ever being soldiers. Their education, thoughts, environment, whole life, had been aloof from military affairs. They had been trained at high speed, in the shortest possible time, four or five months, and sometimes less, having taken the place of the year or more formerly thought necessary. But it was American troops that stopped the enemy at Château-Thierry and at Belleau Wood in June, when the Germans were making a determined drive for Paris and had reached their nearest approach to the French capital. They fought the enemy's best guard troops, drove them back, took many prisoners and held the captured positions. Because of their valor and success the Wood of Belleau will be known hereafter and to history as "the Wood of the American Marines," although other American troops fought with the Marines in that

brilliant action. In the pushing back of the Marne salient in July, into which General Pershing, with absolute faith in the dependability of his men, threw all of his troops who had had any sort of training, American soldiers shared the place of honor at the front of the advance with seasoned French troops. Through two weeks of stubborn fighting the French and the Americans advanced shoulder to shoulder and steadily drove the enemy, who until that time had been just as steadily advancing, back to the Vesle and completed the object of reducing the salient.

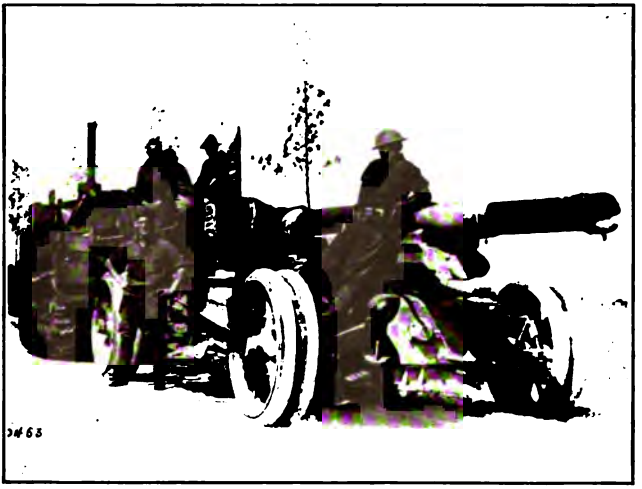
Early in August the First American Army was organized under General Pershing's personal command and took charge of a distinct American sector which stretched at first from Port sur Seille to a point opposite Verdun and was afterwards extended across the Meuse to the Argonne Forest. For the operation planned against the formidable enemy forces in front of him General Pershing assembled and molded together troops and material, all the elements of a great modern army, transporting the 600,000 troops mostly by night. The battle of St. Mihiel, for which he had thus prepared, began on September 12th, and this first offensive of the American First Army was a signal success. The Germans were driven steadily backward, with more than twice the losses of our own troops and the loss of much war material, and the American lines were established in a position to threaten Metz.

Two American divisions operating with the British forces at the end of September and early in October held the place of honor in the offensive that smashed the Hindenburg line, which had been con-

sidered impregnable, at the village of St. Vendhuile. In the face of the fiercest artillery and machine gun fire these troops, supported by the British, broke through, held on and carried forward the advance, capturing many prisoners. Two other divisions, assisting the French at Rheims in October, one of them under fire for the first time, conquered complicated defense works, repulsed heavy counter attacks, swept back the enemy's persistent defense, took positions the Germans had held since 1914 and drove them behind the Aisne river.

The battle of St. Mihiel was a prelude to the Meuse-Argonne offensive and was undertaken in order to free the American right flank from danger. Its success enabled General Pershing to begin preparations at once for the famous movement that, more than any other single factor, brought the war to its sudden end. No military forces had ever before tackled the Argonne Forest. French officers did not believe it could be taken. With the exception of St. Mihiel, the German front line, from Switzerland to a point a little east of Rheims, was still intact. The purpose of the American offensive was to cut the enemy's lines of communication by the railroads passing through Mézières and Sedan and thus strangle his armies. The attack began on September 26 and continued through three phases until the signing of the armistice. Twenty-one American divisions were engaged in it, of which two had never before been under fire and three others had barely been in touch with the front, but of these their commander said that they quickly became as good as the best. Eight of the divisions were returned to the front for second participation, after only a few days rest at the rear. In

MOBILE KITCHEN BACK OF THE FRONT LINES



AN AMERICAN BIG GUN IN FRANCE

all, forty German divisions were used against the American advance, among them being many picked regiments, the best the German army contained, seasoned fighters who had been in the war from the start. They brought to the defense of their important stronghold an enormous accumulation of artillery and machine guns and the knowledge that they must repulse the offensive and save their communications or give up their entire purpose and confess themselves beaten. German troops did no more desperate and determined fighting in the war than in this engagement.

Day after day the American troops moved slowly forward, over rugged, difficult ground, broken by ravines and steep hills, through dense underbrush, in the face of deadly fire from artillery and nests of machine guns hidden in every vantage point, through incessant rain and mud and fog and penetrating cold, pushing the enemy steadily back, until they reached Sedan, cut the German Army's most important line of communication, and so brought the end of the war in sight. For a few days later came the German request for an armistice and terms of peace.

Aiding the fighting men at the front were noncombatant troops who by their courage and zeal helped greatly and won high honor. Regiments of engineers worked with the lines at the front, keeping the roads open, building railways, repairing bridges in front of the advancing lines to enable them to pour across in pursuit of the fleeing enemy, and, in the earlier months, mining and tunneling under the enemy's lines and constructing trenches. Much of the time they worked under fire and it sometimes happened that, suddenly attacked, they seized rifles from

the dead and wounded around them and fought back the assaulting party. The camoufleurs worked close behind and sometimes at the front, disguising roadways, ammunition dumps, artillery and machine gun positions, concealing the advance of troops, most of the time in the shelled areas and often under fire. Immediately behind the front lines during the St. Mihiel and Meuse-Argonne offensives and under the protection of camouflage the map makers and printers of the American Army had big rotary presses on trucks and turned out the necessary maps at once as they were needed. British and French lithographers had told them it could not be done, but their mobile map-making trains kept in touch with the army, turning out a million maps during the Argonne drive.

The Signal Corps gave services of such inestimable value that without them the successes of the combatant troops would have been impossible. The war enlarged the personnel of the Corps from 1,500 to 205,000, of whom 33,500 were in France, where they strung 126,000 miles of wire lines alone, of which 39,000 miles were on the fighting fronts. Their duties were varied and highly specialized and demanded the greatest skill and efficiency. Regardless of danger the personnel of the Corps carried on their work with the front lines, went over the top with the infantry, and even established their outposts or radio stations in advance of the troops. A non-combatant body, it lost in killed, wounded and missing, 1,300, a higher percentage than any other arm of the service except the infantry. Its photographers made over seventy miles of war moving picture films and more than

24,000 still negatives, much of both within the fighting areas.

The enemy captured 4,500 prisoners from the American forces and lost to them almost 50,000, so that the Americans took ten for each one they lost. The American Army captured also in the neighborhood of 1,500 guns. There were 32,800 Americans killed in action and 207,000 were wounded, of whom over 13,500 died of their wounds, while the missing numbered almost 3,000. The total casualties of all kinds, exclusive of prisoners returned, for the Army amounted to 288,500, while those for the Marine Corps totaled over 6,000 additional. The battle death rate for the expeditionary forces was 57 per thousand.

In recognition of their exceptionally courageous and self-forgetful deeds on the battle field nearly 10,000 members of the American Expeditionary Forces received decorations from the French, British, Belgian and Italian Governments. Our own rarely bestowed and much coveted Congressional Medal of Honor, the highest recognition for valor the Government can give, was won by 47 heroes, while Distinguished Service Medals were awarded to several hundred individuals and to a goodly number of fighting units.

Those of their own officers who had had a lifetime of military training and experience marveled at the spirit of these civilian soldiers and their feeling was voiced by one of them who said, "They have taken our West Point tradition of implicit obedience and run away with it, as they have with every other soldierly quality."

Field Marshal Haig complimented the American

divisions who had fought under him upon "their gallant and efficient service," and "the dash and energy of their attacks," said that their deeds "will rank with the highest achievements of the war" and told them, "I am proud to have had you in my command."

Marshal Foch said that "the American soldiers are superb" and told how, when General Pershing wished to concentrate his army in the Meuse-Argonne sector, notwithstanding its many obstacles and forbidding terrain, he consented, saying to the American general, "Your men have the devil's own punch. They will get away with all that."

Other British and French officers on many occasions praised the "gallantry" and "the high soldierly qualities" of these civilian troops, their "energy, courage and determination," their "discipline, smartness and physique," said they were "splendid fighters with marked initiative," and one French general commanding an American division that was in battle for the first time declared that their "combative spirit and tenacity" rivaled that of "the old and valiant French regiments" with which they were brigaded. German documents captured not long after our men had begun to take an important part showed that the foe already had a good opinion of the American soldier, for they spoke of his expertness with weapons, his courage, his determination, his fighting qualities and—curious soldierly quality for a German to recognize—his honor in battle.

Many observers of our own and other nations bore witness to the fine character of the American soldiers back of the fighting lines, among their fellow soldiers of the other armies and the civilian popula-

tion. Their cheerfulness, high spirits, good nature and simple, human helpfulness gave new heart to the soldiers of the Allies with whom they fraternized and made warm friends of the people in the cities, towns, villages and countrysides with whom they came in contact. The Secretary of War, after several weeks of intimate study of our army in France, said that it was "living in France like the house guests of trusting friends." And the Chairman of the Commissions on Training Camp Activities, after two months of investigation in all the American camps in France declared, as the result of this long and intimate association, that the question Americans should consider was not "whether our troops overseas were worthy of us and our traditions but whether we were worthy of our army."

PART ONE: SECTION II. BY SEA

CHAPTER IX

EXPANSION IN THE NAVY

OUR entrance into the war found the Navy ready for immediate service. The almost universal popular sentiment against an army of large size that had been growing in strength for a generation or more had not been manifest against the support of a navy comparable with the navies of other nations. Recognition of the necessity of a better defense for the long coast line of the United States had led Congress in 1916 to sanction the strongly urged plans of the Secretary of the Navy and authorize one of the largest ship-building programs ever undertaken by any nation. This Act of Congress with the ample appropriation that accompanied it laid the basis for a program of naval preparedness and enabled the Department of the Navy to make itself ready to meet the state of war which was threatened by unfolding events. For it not only authorized the building of 156 ships, including ten super-dreadnaughts and six battle cruisers, but by authorizing the enlargement of the Navy personnel and the creation of a big Naval Reserve and a Flying Corps and providing machinery for the expanding of the service as desired it made

possible the putting of the Navy upon a tentative war basis during the months immediately preceding our declaration of war. By the first of April, 1917, its plans had been drafted and its preparations made and it was ready for action. Indeed, its work had already begun, for in the previous month it had provided guns and gun crews for the arming of American merchantmen under the order of President Wilson, made in response to Germany's notice of unrestricted submarine warfare.

Upon the declaration of war on April 6th, the fleet was at once mobilized and a flotilla of destroyers was equipped for foreign service and sent overseas, where the first contingent arrived at a British port on May 4th, 1917. The second reached Queenstown on May 13th, and before the end of the month both were engaged in the work of hunting submarines in coöperation with the British and French navies. Early in June units of the naval aeronautical corps landed upon French shores and inside another month the vanguard of the American Expeditionary Forces, convoyed by the Navy, arrived in France. Battleships and cruisers quickly followed the destroyers across the ocean and took their places with the British Grand Fleet, on watch for the appearance of the German navy from behind its defenses at Heligoland.

While it was thus quickly making itself felt in the prosecution of the war, the Navy Department at once entered upon a great program of development, expansion and training. It had in commission when war was declared 197 vessels. When the armistice was signed there were 2,000 ships in its service. In the same time its personnel had expanded from 65,777

to a total of 497,000. In addition to the cruisers and battleships on the ways, 800 smaller craft were built or put under construction during our nineteen months of war. Formerly the building of a destroyer required about two years. But the great importance of that type of vessel and the urgent need for more of them speeded production to the fastest possible pace and at the end of the war destroyers were being built in eight months and in some cases in even less time. In one instance a destroyer, the Ward, at the Mare Island Navy Yard, was launched in seventeen and one-half days from the laying of its keel and within seventy days was in commission. The end of the war found the American Navy with more destroyers in service or under construction than the navies of any two nations had possessed before the outbreak of the war in 1914. In the first nine months of 1918 there were launched 83 destroyers, as against 62 during the entire nine preceding years.

The submarine menace made necessary the concentration of effort upon types of vessels fitted to deal with it and therefore construction of destroyers and submarine chasers was rushed and every vessel that could be effectively used was put into that service. Submarine chasers to the number of 355 were built for our own use together with fifty for another nation. A new design, the Eagle, was worked out in the Navy Department and preparations were made to produce it in quantity. The manufacturing plant had to be built from the foundation. Work upon the plant was begun in February, 1918, and the first boat was launched the following July. Its tests were successful and two had been put in commission when the armistice was signed while work was being speed-

ed upon over a hundred more, of which part were for one of our co-belligerents. After the destroyer, the Eagle boat was believed by naval officers of our own and other nations the best weapon for the extermination of the submarine.

Privately owned vessels of many kinds, to the number of nearly a thousand, were taken over and converted to naval uses and many new small craft were built in order to provide the hundreds of boats needed for patrol service and as tugs, mine sweepers, mine layers and other auxiliaries. Two battleships and twenty-eight submarines built by the navy were completed and put into service during the war.

Along with this big increase in ship production went a similar expansion in naval ship-building plants and in production of implements of warfare for the navy. Before we entered the war the Navy's ship-building capacity amounted to ways for two battleships, two destroyers, two auxiliaries and one gunboat. At once was begun a work of expansion which within a little more than a year added five ways and, when completed, would provide facilities for the simultaneous construction of sixteen war vessels, of which seven could be battleships. Three large naval docks, which can handle the largest ships in the world, were built. Camps were constructed for the training of 200,000 men. A naval aircraft factory was built which turned out its first flying machine seven months after work started upon the factory. A little later it was producing a machine a day. Naval aviation schools were established and production was speeded in private plants of sea planes, flying boats and navy dirigibles and balloons.

The navy's bureau of construction and repair un-

dertook the work of making seaworthy again the hundred and more German ships in our harbors when war was declared which had been seriously injured by their crews, under orders from the German government. So much damage had been done, especially to the cylinders, that the enemy had thought, according to memoranda left behind, it probably could not be repaired at all and certainly not within a year and a half. Officers of the navy, in the face of opposition by engine builders and marine insurance companies, determined to make the repairs by means of electric welding, the use of which on such an extensive scale was unprecedented. The experiment was successful and these great ships were in service within six months, the navy's engineering feat having thus saved a year of time and provided means for the transportation of half a million troops to France.

The naval gun factory at Washington was enlarged to double its output. The navy powder factory and the Newport torpedo station had their capacity greatly increased and a large new mine-loading plant was constructed. A big projectile factory was begun in the summer of 1917, and the buildings were finished, the machinery installed and the plant in operation in less than a year.

Within a year and a half the work of the ordnance bureau of the navy increased by 2,000 per cent, its expansion including the gun, powder and projectile factories mentioned above. Plants for various purposes taken over by the bureau from private industry increased their output at once by large percentages, in one case, in which the product was steel forgings, 300 per cent. The depth bomb proved one of the most efficient means of fighting the submarine.

It contains an explosive charge fitted with a mechanism which causes explosion at a predetermined depth under the water. An American type was developed and within a few weeks was being manufactured in large quantities, while manufacture of the British type was continued for their navy. A new gun, called the "Y" gun, was devised and built especially for firing depth charges. It made possible the throwing of these bombs on all sides of the attacking vessel, thus laying down a barrage around it. A star shell was developed which, fired in the vicinity of an enemy fleet, made its ships visible, our own remaining in darkness. Anti-submarine activities made necessary an enormous increase in the manufacture of torpedoes and torpedo tubes, which grew by several hundred per cent and far surpassed what had been thought the possibility of production.

The ordnance bureau of the navy developed a new type of mobile mount for heavy guns which, by the use of caterpillar belts, made them as mobile as field artillery although the weight and muzzle velocity of the huge projectile rendered impossible the use of a wheeled gun carriage. The entire gun and mount, weighing 38 tons, can be readily transported by this means over any kind of ground. Immense naval guns, originally intended for use on battle cruisers, were sent to France with railway mounts especially built for them by the navy. Their important and successful operations overseas are described in the chapter on "The Navy on Land."

Smoke producing apparatus, to enable a ship to conceal herself in a cloud of smoke, was evolved of several kinds, for use by different types of vessels. A shell that would not ricochet on striking the water,

when fired at a submarine, and so glance harmlessly away in another direction, was an immediate necessity, brought about by the conditions of sea warfare. After many experiments a shell was devised that on striking would cleave the water, to the menace of the submarine's hull, and, equipped with a depth charge, was soon in quantity production. A heavy aeroplane bomb which united the qualities of a bomb with those of a depth charge and did not explode on striking the water was another development of the navy ordnance bureau, which also devised a non-recoil aircraft gun which, after much experiment, was installed on our seaplanes and put into quantity production. Its success meant the passing of an important milestone in aircraft armament. An American device for detecting the sounds made by a submarine gave highly important aid to that phase of the war. The Navy Department equipped our own submarines, destroyers and chasers with them and furnished them in large numbers to the British navy.

Not only was there need for an immense production of mines and depth charges for ordinary uses, but the decision by the British to carry out the American Navy Department's plans for a mine barrage across the North Sea, whose story is told in more detail in the chapter on "Working with the Allied Navies," made necessary the production in enormous quantities of a new type of mine. Combination of the best types already in use and experiment with new features resulted in a satisfactory product of which large quantities were made and shipped abroad. All this need for high explosives caused a critical shortage and the supply of TNT, the standard charge

for mines, aerial bombs and depth charges, was almost exhausted, because of the scarcity of toluol, its principal ingredient. In this menacing situation the navy's bureau of ordnance began making exhaustive experiments which finally proved that xylol, the near chemical relative of toluol, could be used in its place. The resulting high explosive, to which was given the name TNX, proved to be the equal in every way of TNT and the building was ordered of a plant for the distillation of xylol which would make possible the production for the following year of 30,000,000 pounds of high explosives.

Armament had to be furnished for merchant ships, 2,500 of them, equipment for destroyers and submarine chasers, and all the multitude of requirements for ships on distant service and for the repair ships that accompanied them. All this increase in ships and plants and personnel called for an enormous increase in the amount of materials and stores it was necessary to provide for them. The greatest total of supplies bought for the Navy in any one pre-war year amounted to $27,000,000. But the greatest total for a single day during the war amounted to $30,000,000.

Among the giant tasks which the Navy undertook during the war was the building of an enormous structure in Washington for the housing of the Navy Department, of several immense storehouses, of which one in Brooklyn is said to be one of the largest storehouses in the world, the installation at Annapolis of the greatest high-power radio station yet erected, and the completion of the powerful radio plant at Pearl Harbor.

The Medical Department of the Navy increased

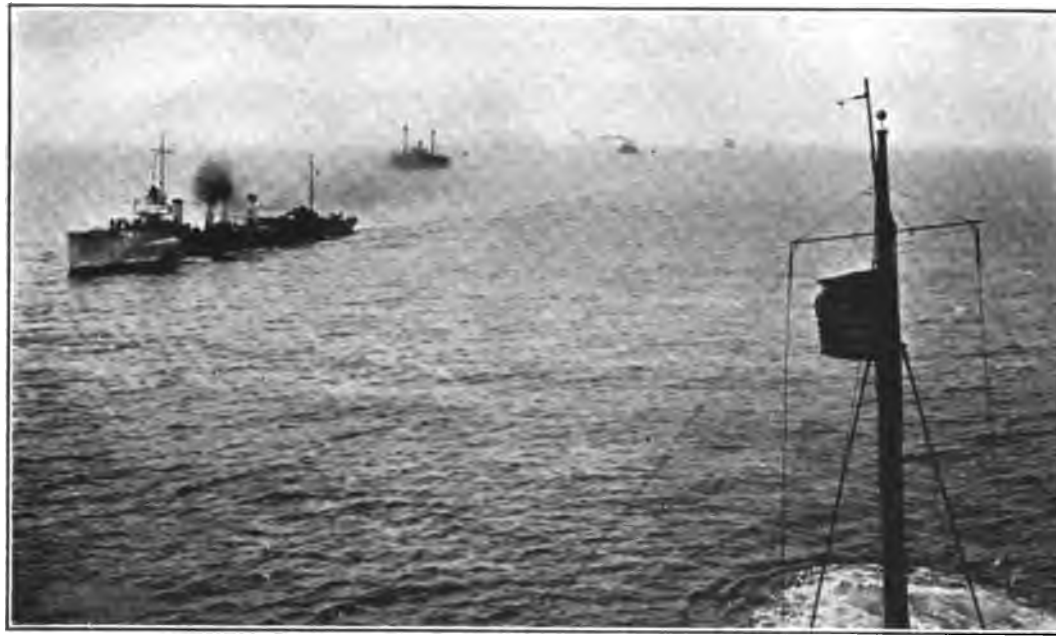
under war conditions from 327 doctors to 3,074, dentists from 30 to 485, women nurses from 160 to 1,400, and Hospital Corps members from 1,585 to 14,718. Three hospital ships were added to its equipment, it had numerous hospitals and dispensaries scattered through Great Britain and France and its hospital service at home was enlarged from 3,000 to 17,000 beds.

The inventive ingenuity of the American people was apparently much attracted towards the problems of sea warfare in this conflict, for they began to send ideas, suggestions and devices to the Navy Department even before the United States became a belligerent. After that date the Consulting Board of the Navy, which has charge of such matters, was almost snowed under by these suggestions. During our participation in the war the Board examined and acted upon 110,000 letters, of which many included detailed plans or were accompanied by models of the contrivances which their writers hoped to have adopted. Most of them were either worthless or already known, but a comparatively small number were found valuable.

At the beginning of our war activities our naval roster listed over 65,000 officers and men, with 14,000 more in the Marine Corps. A year and a half later the Marines numbered 70,000 and in the Navy there were a little more than 497,000 men and women, for a goodly number of patriotic women had enlisted in order to undertake the duties of yeomen and so release able bodied men for active service. The total permanent personnel of the Navy, officers and men, had grown to 212,000. This rapid expansion had made necessary intensive training for both men and

officers that was carried on with never ceasing activity at training stations on shore and on ships at sea in both home and foreign waters. In small-arms training alone a force of 5,000 expert instructors was built up who trained an average of 30,000 men per month.

How all this immense expansion in ships, men, stores, facilities and production measures against the previous history of the Navy appears in this fact: In the almost century and quarter since the Navy was established in 1794 until and including 1916 its expenditures totaled, in round numbers, $3,367,000,000, an amount which exceeded its expenditures in the next two years alone by only $34,000,000.



CONVOY OF TROOP SHIPS ENTERING THE HARBOR OF BREST

CHAPTER X

OPERATING AN OCEAN FERRY

THE United States had to carry on its share in the war from a base three thousand miles distant from the battle zone and to transport troops, munitions, supplies across an ocean infested by submarines intent upon sinking as many of them as possible. It was a task so unprecedented and so difficult that before it was attempted it would have been thought, in the dimensions it finally assumed, utterly impossible. The enemy was so sure it was impossible that he staked all his hopes and plans upon its failure.

In this stupendous enterprise the British Government gave much invaluable assistance. Without its help the task could not have been discharged with such brilliant success, for this country did not have enough ships—no one country had enough—for such an immense program of transportation. But the two nations combined their resources of shipping and naval escort and with some help from the French and Italian Governments the plan was carried through with triumphant success.

With the incessant call from Britain and France of "Hurry, hurry, send men, and more and more men, and hurry, hurry" speeding our preparations, the need for transport facilities for men, munitions

and supplies was urgent. And those facilities were meager indeed. When war was declared we had two naval transports, of which one was not quite completed and the other proved unseaworthy. There was no organization for transport service, because none had ever been needed. For the first transport fleet, that sailed in eight weeks after the war declaration, the Government chartered four cargo vessels, nine coast liners and a transatlantic passenger ship and at once began to prepare them for their new uses and to engage and alter other ships for the transport service. They had to be overhauled and made seaworthy, staterooms had to be ripped out and in their place tiers of bunks built in, big mess halls made ready, radio equipment, communication systems, naval guns and other defensive facilities installed, ammunition stored, lookout stations built, ample quantities of life boats, life rafts and life preservers provided.

Work upon the big German liners in American ports that had been seized upon our declaration of war to repair and refit them for use as transports was undertaken by the navy and carried forward with speed and zeal. Under orders from the German Government their officers and crews had injured them in many ingenious ways to such an extent that they did not believe the ships could be made seaworthy again in less than a year and a half, at the least. Cylinders had been ruined, valves wrenched apart, engine shafts cracked, boilers injured, pipes stopped up, ground glass put into oil cups, acid poured upon ropes and into machinery, bolts sawed through and all manner of mischief done that would injure without destroying the seaworthiness of the ships.

For all of this reconstruction and refitting work

there was insufficient skilled labor, indeed, insufficient labor of any sort, because the needs of the fighting forces were drawing men by the hundred thousand into the training camps and the equally urgent needs of the ship-building program, the munitions manufacture, the coal mines, the hundreds of factories that were turning their attention to the vital necessities of warfare, were draining the labor supply. There were insufficient numbers also of trained personnel to officer and man the huge transport service that would be necessary. Training for this work was carried on in schools on shore and on ships at sea, and civilian officers and crews were taken into the service. Sailors from the navy yards turned to with a will for mechanical labor in the repairing and refitting of ships, their zeal compensating, in some measure, for their lack of skill.

The British Government gathered up all the ships it could spare, taking risks with its own supply of food and raw materials, and sent them to take part in this enterprise upon whose success depended the fate of the Allied cause. The seized liners were ready for service long ahead of the time in which any one had thought they could be repaired, the first of them taking their trial trips within five months of the declaration of war and the remainder becoming ready for service at various times within the next four months. So much more efficient had the engineers of the navy made them that the utmost speed the Germans had been able to get out of several of them was increased by two or three knots. The French and Italian Governments supplied a few ships, and the United States Shipping Board furnished scores of

merchant ships, as they became available under its program of ship-building and taking over of sea-going vessels. Later in the war period a number of vessels were obtained from Holland.

It was agreed between the War and Navy Departments that the Army should take charge of the work of operating docks and providing and loading cargoes and that in the hands of the Navy should lie the responsibility of providing more tonnage when necessary and of equipping, keeping in repair, operating and escorting the transports. To the Navy therefore belongs the credit of having operated with marvelous success for a year and a half an ocean ferry service of enormous proportions across 3,000 miles of submarine infested seas. To call it a ferry service is no exaggeration. For the convoys started so promptly from American shores, moved with such precision across the Atlantic, discharged their passengers and left upon the homeward trip in such good time that the ships came and went upon almost as sure a schedule as that of a ferry across a river. In all, seventy-six groups of transports sailed with troops, the size of a group ranging all the way from a single unescorted ship to as many as fifteen troop ships escorted by from one to four or five cruisers, destroyers and converted yachts. The famous Leviathan, with her capacity for carrying from 9,000 to 11,000 men, made ten such trips, most of them unescorted, her own guns, the skill of her gun crews, the care with which watch was kept and her speed and maneuvering ability being thought to give her ample protection. Trip after trip the Leviathan took with the greatest regularity, steaming down New

York Bay with her decks brown with khaki-clad men, speeding across the Atlantic, unloading on the other side and returning to her dock in the New York port promptly in sixteen days. And in eight days more, just as promptly, would she be ready for another trip.

From a beginning that was next to nothing, for it lacked merchant ships, organization, officers, crews, there was developed a cruiser and transport fleet of 42 transports and 24 cruisers with a personnel of 3,000 officers and 42,000 men. There was a fleet of cargo carrying ships in steady service numbering 321 and aggregating 2,800,000 tonnage, nearly one-third of which were supplied by the United States Shipping Board Emergency Fleet Corporation and officered and manned by the efforts of the Navy Department. At the end of hostilities there had been transported across the Atlantic in the seventeen months from the first sailing over 2,000,000 troops, of which 911,000 had been carried by U. S. naval transports and 41,500 by other United States ships, while British and British leased ships had carried 1,075,000 and French and Italian ships 52,000. In the summer of 1918 as many as 300,000 per month were carried overseas. Of the entire army of 2,079,880 men American ships carried 46¼ per cent and British ships 51¼ per cent, while 2½ per cent sailed in French and Italian ships. Of the total strength of the naval escort guarding these 2,000,000 troops 82¾ per cent was furnished by the United States, 14⅛ per cent by Great Britain and 3⅛ per cent by France. All the troops carried in American ships were escorted by American warships, cruisers, destroyers and convert-

ed yachts, and American destroyers gave a large part of the safe conduct through the danger zone to the troops that were carried by British, French and Italian ships.

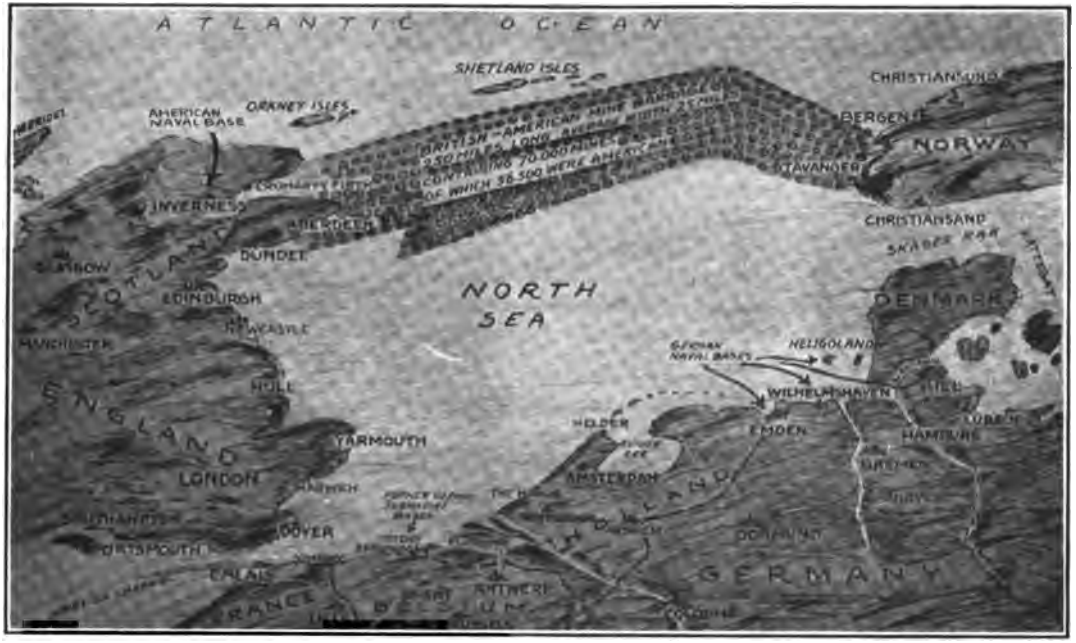
The enemy had counted confidently upon being able to paralyze American transport of troops and supplies by submarine activity and his undersea vipers were constantly speeding back and forth and up and down through the eastern waters of the Atlantic and even as far as its western shores. But no troop transport on its heavily laden eastward trip was ever lost and none at all under American escort. Only three troop ships, all told, were sunk by submarines, and these were westward bound and the loss of life was very small. The first convoy of troop ships twice battled with submarines and many others were attacked, while the naval officers who did convoy duty saw the undersea boats upon almost every voyage. By submarines and raiders there were lost during our war period 130 cargo carrying ships but under the guarded convoy system these losses steadily decreased.

In a convoy the troop or merchant vessels sailed in echelon formation with destroyers or cruisers steaming in front and at the rear while a destroyer ranged in zig-zag course along each side. Naval gun crews manned each ship and on each one, in addition to the watches kept on board the escorting vessels, keen eyes constantly swept the surrounding waters, every moment of the day and night. At night all lights were dimmed, so that not a ray of even a lighted match on deck was ever visible, and the great black hulks rushed onward through the darkness, never knowing

at what moment they might collide with one another or with one of the escorting vessels. But so skillfully navigated were they that all such dangers, though they were very real, were escaped.

No greater feat was achieved by our fighting forces than this of ferrying across the Atlantic an army of 2,000,000 troops, with their food, equipment, and munitions, and the material necessary in enormous amounts for the creating and carrying on of the Service of Supply. It was an arresting achievement not only because of its unparalleled bigness and its audacity and success but also because of its vital importance. Without it the war could not have been won. And the credit for the achievement belongs to the American Navy. Our co-belligerents gave vitally important aid. But the American Navy suggested, developed, organized, supervised, operated and was responsible for the entire huge system. Into its success went many factors, not the least of them the foresight and watchfulness and careful planning of the officials of the Navy, from the Secretary down to the junior officers on the troop ships. There was constant study of the submarine peril and of means to lessen it, and it was, by autumn of 1918, almost eliminated by the combined efforts of the associated nations. There were the zeal and diligence of officers and crew alike and the consequent high morale, the skill of the gun crews, who never ceased from the effort to make it better still by daily target practice, and that constant attention to detail which leaves no loophole anywhere through which success might dribble and slide away. And finally there were the skill, courage, devotion and audacious spirit of the naval

officers whose ships escorted the convoys back and forth across the ocean. All these and other factors combined to make possible an achievement that stands out commandingly even in a war compact of big things and huge achievements.



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MINE BARRAGE ACROSS THE NORTH SEA

CHAPTER XI

WORKING WITH THE ALLIED NAVIES

THE American Navy was the first section of the American fighting forces to take part in the war. It was ready to begin operations at once upon our declaration of war, it lost no time in sending its first contingent across the ocean and the importance of its coöperation with the navies of our co-belligerents constantly increased until the end of hostilities. Aside from the vital consequence of its achievement in operating an Atlantic ferry, one of the capital performances of the entire war, its chief work was done in coöperation with the British, French and Italian navies in European waters from the Mediterranean to the White Sea.

Upon our entrance into the war a patrol force was at once organized charged with the protection of the western waters of the Atlantic and the shores of America, from the Bay of Fundy to Colombia, including the West Indies and all the region west of the 50th degree of longitude. But within a few months it became apparent that the enemy would confine his efforts mainly to European waters and accordingly most of our naval forces were sent overseas. For the protection of our own coasts and coastwise shipping when, during the second summer, enemy submarines appeared along our own shores, submarines, sub-

chasers, destroyers, mine sweepers and other small craft of offense and defense were ready to be put into action and prevented the enemy from doing any considerable damage.

At the end of hostilities we had in European waters 364 vessels of all classes, of which 304 were warships, and serving there were 5,000 officers and 70,000 enlisted men of our Navy, a total greater than its full strength when we entered the war. Our destroyers had been steaming an average of 275,000 miles per month and our ships of all classes, including only those actively engaged in naval duties and excluding those operating as escorts, had steamed a total monthly average of 626,000 miles. Individual destroyers steamed a total, during the first year of service overseas, of from 60,000 to 64,000 miles. The Navy established bases at the Azores, Gibraltar, Corfu, at many places along the French coast, at English Channel ports, on the Irish coast, in the North Sea, at Murmansk and at Archangel, fifteen in all. Our 14-inch naval guns mounted on British monitors did their share in the attack on Zeebrugge, and smaller naval guns mounted on floats and manned by Italian crews gave much aid in the defense of Venice.

The bases at the Azores and at Gibralter, where we maintained a considerable naval force, were provided with all the necessities for our cruisers, destroyers, submarines, chasers and other small craft which joined the Allied navies in the policing of the Mediterranean and the adjacent Atlantic waters where we coöperated in the hunting of the undersea enemy and the protecting of transport and merchant craft. Several of our battleships and cruisers worked with the Italian Navy in Mediterranean waters. American

sub-chasers gave important aid in the battle of Durazzo, in which they were given the advance post of honor and, preceding the Allied fleet, went forward picking a way of safety for the larger vessels through the thickly strewn mine field. Inside the harbor they shared in the battle, aiding in the attacking and sinking of Austrian steamers, destroyers and submarines. Assisting in mining operations and in the construction of a mine barrage was another of the important works of this group of submarine chasers in the Adriatic Sea.

Several naval bases were established along the coast of France and through the last year of the war seventy vessels, of which half were destroyers, operated in these waters, their chief duty being to meet the convoys of American troop and cargo ships and escort them through the danger zone. They also worked up and down the French shores, hunting enemy submarines and escorting coastwise shipping. At all these repair and supply bases it was necessary to provide extensive facilities; a number of huge fuel oil tanks were built, most of the new destroyers and many other ships being oil-burners; several naval hospitals were constructed; a dozen naval port offices were established, from Cherbourg to Marseilles, to expedite the movements of American shipping through as many ports; naval aviation stations were built; rescue tugs and a wrecking steamer watched for and assisted damaged vessels; minesweepers kept open the approaches to the ports.

The principal bases from which our destroyers operated were Gibraltar, Brest and Queenstown, of which the last named was the largest; the submarine chaser bases were at Queenstown, Plymouth and

Corfu; and those for our submarines were at the Azores and at Berehaven on the Irish coast. The flotilla of destroyers that was dispatched from the United States a few days after our declaration of war reached Queenstown, part of it within four and the rest within five weeks after that date, and the whole flotilla was at work in coöperation with the British forces within eight weeks after our entrance into the war. In the latter part of 1917 a squadron of six American battleships was sent to strengthen and cooperate with the British Grand Fleet that was on watch in the North Sea to give battle to the German ships if they should come out from their hiding place behind the defenses of Heligoland. It was this vigilant watch of the Grand Fleet, assisted by our battleships, that kept the German navy off the high seas, where it would have raided commerce, made far more difficult the transporting of our troops and war material to France, fought our own and the Allied warships and greatly prolonged the war and made it even more bloody and destructive. Our craft constituted twelve per cent of the fleet that kept the German navy thus bottled up and rendered it incapable of harm.

The American squadron worked in entire harmony with the Grand Fleet, and was assigned to one of the two places of honor and importance in line of battle, the head or rear of the battleship force. So vigilantly did the Grand Fleet keep its watch and so persistently did it go after the enemy whenever he dared to appear, whether in a single ship, a squadron or his entire fleet, and so vigorously chase him back that he ventured out less and less frequently and toward the end rarely came more than a few

miles from his base. All manner of temptations were used to induce him to come out into the open where battle could be joined—a few ships apparently detached venturing into the Heligoland Bight, merchant ships apparently without protection passing near the entrance to the Bight, and other devices. When the German fleet did emerge and a battle seemed imminent, the American division of battleships headed the line and would have led the attack if the enemy had not slipped quickly back.

The plan of laying a mine barrage across the North Sea, from the Scottish coast to the Norwegian shore waters, originated with the Ordnance Bureau of the American Navy. For some time the British Admiralty insisted that it was not practicable, but after much discussion they finally consented and the details of the operation of the scheme were worked out together. A new type of mine was demanded, because of the depth of the water, and this and a new firing device had already been developed by the Ordnance Bureau of the Navy. The number of mines required to lay a barrage 245 miles long and 20 miles wide was so enormous and the need to have them ready at the earliest possible moment so urgent that it was impossible to provide them by the usual methods of manufacture. Therefore the mine was divided into its many component parts and these were separately produced in as many as four hundred industrial factories. The parts were partially brought together in sub-assemblies in this country, and were thus shipped to Europe, where the complete assembling was done just prior to issue to the mine planters. There were manufactured 100,000 of these mines, of which about 85,000 were shipped abroad, some of

them being used in similar mine barrages elsewhere. For this purpose a fleet of over fifty merchant ships was taken over by the navy and fitted out for the carrying of all this mine material overseas. Out of the entire fleet only one was lost by enemy action. Mine bases were established on the coast of Scotland, many mine layers and auxiliary vessels were fitted out and the work was carried on at a high rate of speed, sometimes as many as a thousand mines a day being laid. The American Navy furnished all the mines and laid 80 per cent of them for this huge barrage, of a greater length and in deeper water than had ever before been thought possible. The barrage was fatal to at least ten submarines within a short time after it was finished, and had the war continued would have reduced the submarine danger to little consequence.

Immense quantities of oil were needed on the east coast of Scotland for the British and American ships of the Grand Fleet and other purposes and the practice had been to send it on its journey from the United States in tankers around the north coast of Scotland. But enemy submarines took a heavy toll of the precious liquid and the Navy Department suggested the laying of a pipe line across Scotland. The work of laying the line was mainly done by the American Navy, which furnished the pipe for the work. The line could deliver 100 tons per hour and was the longest in Europe. The entire work was completed in six months and was finished on the day when firing ceased.

The relations of the American Navy with the Allied fleets were in every case cordial and harmonious. The close and friendly coöperation was espe-

cially noteworthy with the British fleet, because the major portion of American operations was with it and the association was closer and more constant. American vessels operated under British command and British under American command effectively and without friction and the ability, skill and seamanlike qualities of each, officers and men alike, won hearty praise from the other. The British Admiralty sent a commission to the American squadron of the Grand Fleet to inquire how the ships were kept in such a state of readiness and high efficiency without sending them to the dockyards.

American naval forces in European waters engaged in 500 battles with submarines, in which it was known that at least ten undersea boats were sunk by them and thirty-six others damaged. Deaths in the Navy from war causes totaled 1,200 and at the close of hostilities there were 15,000 patients in naval hospitals.

In both European and American waters a total of 48 naval vessels of all classes was lost during the war, of which the armored cruiser, San Diego, which struck a mine off the coast of New York, was the most important. The losses were occasioned by submarines, mines, collisions and miscellaneous causes.

CHAPTER XII

THE NAVY ON LAND

THE American Navy did work important and memorable on land as well as upon the sea. Its Marine Corps fought in decisive battles with unsurpassed courage, daring, endurance and aggressiveness and some of its big guns were instrumental in more quickly bringing to pass, unexpectedly early, the order to "cease firing."

The Marine Corps, the landing and fighting force of the Navy, added glowing pages to its already splendid record. As with every other fighting force of the United States, it had first to increase its numbers and train its new members. It had a total, when we entered the war, of 14,000 officers and men. At the end of the war it had 70,000, the new members having come, mainly by enlistment, from all classes of the community and including business, professional, working and college men. In one instance a whole college battalion enlisted together. Marine Corps service has always attracted young men of the highest quality and these new members were especially notable for their intelligence, spirit and fine soldierly character, qualities that shone brilliantly in their action in the lines of battle. More democratic than any other fighting force of the nation, the Marine Corps officers are mainly promoted from

its rank. Several officers' training camps were held at which intensive, practical and competitive work gave thorough training in quick time and yielded a plentiful supply of officers chosen in accordance with the work and character of the men. Certain quotas of the Students' Army Training Corps, which was hard at work when the armistice was signed, were designated for Marine Corps service. Recruiting and training stations for the Corps were increased and enlarged and intensive training of the recruits went on steadily, with such especial attention to rifle practice that when the Marines drove the enemy back at Belleau Wood over 90 per cent of the men in line had qualified as marksmen, sharp shooters or expert riflemen.

When the German Army, in its steady drive toward Paris in the last days of May, 1918, had reached its nearest point to the capital city and the Allied armies were facing a serious crisis, General Pershing offered to Marshal Foch whatever he had in men and material that the French Generalissimo could use and a division composed of regiments of Marines and of the Regular Army was thrown forward to block the German advance, which had been rolling steadily onward and driving everything before it at the rate of six or seven miles per day. The Marines blocked the advance in an engagement on June 2nd. Calmly setting their rifle sights and aiming with precision, they met the German attack and under their deadly fire, supported by machine guns and artillery, the enemy lines wavered, stopped, and broke for cover.

Then followed, a few days later, the fierce and stubborn attacks of the Marines upon the defenses which the Germans had set up and which they held

with determination. Belleau Wood, a jungle of underbrush, heavy foliage and piles of boulders, they had filled with machine gun nests. The Marines attacked in wave formation, rushing, halting, rushing again, the rear waves plunging forward over the dead and wounded bodies of those who had fallen. It was almost a month before the Americans reached their final objectives and completely routed the Germans from Belleau Wood, to be known ever after as the Wood of the American Marines because of the valor and heroism with which it was won. They fought day and night, day after day, much of the time without sleep or water or hot food. Their officers sent back messages that the men were exhausted and must be relieved and were told that the lines must hold and if possible continue to attack. And the lines again went forward. They fought from tree to tree, they charged machine gun nests with the bayonet, wiped them out and turned the guns against the retreating foe. Some companies lost every commissioned officer, some that had entered the battle 250 strong dwindled to fifty or sixty. The Germans threw in fresh troops, their best Prussian Guards, with orders to retake the lost positions at whatever cost. But the Marines and their fellows of the Regular Army held on, repulsed the fresh attacks, and slowly advanced their positions. And at last, toward the end of June, with some reënforcements and following an artillery barrage that tore the woods into fragments, the Marines made their final successful rushes and with rifle and bayonet cleaned out all the remaining machine gun nests. The enemy had been turned back, Paris had been saved, the morale of the best German troops had been undermined and the Allied commanders and

armies had been shown what raw American troops could do. After the battle of Belleau Wood neither British nor French commanders had any doubt about sending American troops anywhere, no matter whether they had had much or little training and little or no experience.

At Soissons, in July, the Marines again showed their valor and at the battle of St. Mihiel, in mid-September, they took over a portion of the line and, attacking with two days' objectives ahead of them, won them all by mid-afternoon of the first day. And early in October the Second Division, brigaded with the French and still composed of Marines and Regulars, swept forward in an attack on Blanc Mont Ridge, east of Rheims, the keystone of the German main position, for the possession of which German and Allied Armies had fought many bitter battles. The Marines and their companions attacked the rugged and wooded Blanc Mont, rushed the enemy before them across its summit and pushed him down the slope, repulsed counter attacks and forced the Germans to fall back from before Rheims and yield positions they had held for four years.

The casualty list of the Marine Corps amounted to about 6,000, of whom only 57 were captured by the enemy. They lost approximately half of their numbers who entered battle. But they took more prisoners than they lost, all told, of their own men, and they inflicted more casualties than they received.

The big guns sent by the Navy to France for land warfare played an important part in the decisive battles of the last few weeks of the war. These huge, 14-inch guns, 66 feet long, had been intended originally for the new battle cruisers, but a change of

ship design had made them available for other uses and the Navy Bureau of Ordnance suggested that they be put on railway mounts and used on land. They were first offered to the British authorities for use behind their lines, but they doubted the effectiveness of the guns and delayed final answer until General Pershing asked for them. At the end of December, 1917, not a drawing for the mounts had been started. Four months later one of the guns was rolling on the wheels of a completed mount for long range tests at the Sandy Hook Proving Ground. At the end of hostilities forty-four guns and mounts had been sent over in various steps of preparation for the front and six of the monsters had been in action, throwing their destructive shells far behind the German lines.

The railway mounts, designed for this particular purpose, were built and covered with armor plate by the Navy according to plans and designs prepared by its Ordnance Bureau, while the locomotives and the twelve cars for the operating forces of each gun, including berth and kitchen cars, armored ammunition cars, machine shop cars containing everything from a forge and anvil to a handsaw, crane and wireless cars, were all built and equipped especially for the purposes of these land batteries of naval guns. Intensive training was given to the men, all of them taken from naval forces, who would operate the huge batteries in France and serve the guns in action. The whole battery was so mobile that even if it were in action when the order came to move, the gun, personnel and entire train of cars could be put under way in an hour.

The first gun to be sent landed in France in the

latter part of June but did not go into action against the enemy until mid-September, when, placed near Soissons, it fired on the railroads entering Laon. It had been intended for use against the German "Big Bertha" that had been dropping shells upon Paris from a distance of over seventy miles, but on the day in August when the American gun was ready to begin action "Big Bertha" retired and was heard of no more.

The German long range guns which bombarded Paris and Dunkirk and other places were set on permanent steel and concrete foundations, and therefore were immobile, and the military efficiency of their shells was reduced by the fact that they were small and made for long flight. The enormous shells of the American guns had a range of thirty miles, weighed 400 pounds each, seven times as much as the German, and could penetrate eight feet of solid concrete. Each gun, without its mount, weighed more than a hundred tons. They fired heavier projectiles and had a greater range than any mobile land artillery that had previously been used. Their chief usefulness was in the destruction of ammunition dumps and of railroad yards and rolling stock and the consequent demoralization of the enemy's transportation system. When the shells from one of the guns were directed upon the railroad stations and yards of Montmedy and Longuyon they stopped all traffic there and one which struck the German headquarters killed twenty-eight members of the general's staff.

Cruising through France like battleships on wheels, demonstrating their perfect mobility and proving their usefulness by cutting the enemy's lines of communication and seriously obstructing his transporta-

tion, these big naval guns on railway mounts proved their value so triumphantly that the Navy had been requested, when the end came, to provide as many more as it could rush quickly to the front.

The Navy also removed a number of 7-inch guns from battleships, the changed conditions of warfare demanding a lighter and quicker firing gun, and devised for them, at General Pershing's request, a new type of mount, utilizing the principle of the caterpillar belt and thus making it possible for them to travel directly over any kind of ground. So satisfactory were the first tests that the Army asked the Navy to furnish 36 such guns and mounts as quickly as possible and these were being rushed to completion when the armistice was signed.

The Navy maintained a large personnel and carried on considerable operations on shore both in Great Britain and France. On the coast of each of these countries was a series of bases for the repair and upkeep of escorting and patrolling ships, from cruisers to converted yachts. In many cases it was necessary to construct complete repair plants. At every naval base overseas there was a fully equipped hospital. In Scotland the Navy took over an entire watering place whose hotels, bath-houses and other structures were converted into large hospital buildings wherein were cared for many British as well as our own sick and wounded.

CHAPTER XIII

THE WINGS OF THE NAVY

THE wings of the Navy, that had barely begun to sprout when the United States became a belligerent, grew in a year and a half as if under a conjurer's wand. Previous to that time the appropriations that had been granted for the development of naval aeronautics had been so small that little could be done. Upon our declaration of war the Navy had 22 low powered seaplanes of no value except for training purposes, five kite and two free balloons and one dirigible balloon, and the Naval Aviation Service had three stations, but no adequate training field, while its personnel consisted of 45 naval aviators and less than 200 enlisted men.

When the armistice was signed the Aviation Service of the American Navy had 1,656 trained airplane pilots, of whom half were in service over European waters; 1,349 ground, or executive, officers; 3,912 student officers at training fields at home or abroad who would soon have been ready for service; an enlisted personnel numbering almost 37,000; approximately 8,000 trained mechanics and 6,000 more in training; in France, sixteen naval aviation stations besides others for training and supply work; two stations in England and four in Ireland; three stations in Italy and the Azores; two stations in Canada;

one station in the Canal Zone; eleven stations in the United States; 759 seaplanes and flying boats in service for patrol and bombing work and 140 airplanes or land machines for land service, with 491 seaplanes and 100 land airplanes for training purposes, while a dozen planes of new and experimental types were being tried out; 282 kite and seven free balloons and 11 dirigible balloons. Many hundreds of seaplanes, flying boats and balloons of various kinds were on order for early delivery. All this development of material and personnel, of systems of training for pilots, ground officers and mechanics, of stations and service, and of the big and smoothly working organization that produced important results in the work of the naval aviators was the growth of but eighteen months.

To ensure the rapid production of planes a naval aircraft factory was erected at the Philadelphia Navy Yard. The contract for its construction was signed in August, 1917, and in the following March, 228 days after the breaking of the ground, the first machine had been completed and was given its trial flight. And a few days later this machine and another which had followed it to completion and trial were on their way to Europe. In the meantime, in order to meet the expansion which was foreseen to be necessary in naval aviation plans, the naval aircraft building was greatly enlarged. Included in the extension was a huge assembly plant for the assembling of airplane parts separately built in a large number and variety of private manufacturing plants whose work for the aircraft factory was directed by its management. By this means team work was secured, resulting in quick deliveries and an ample

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NAVAL GUN ON RAILWAY MOUNT

supply of craft for both service and training purposes. By September of 1918 enough naval aircraft had been shipped overseas to meet the needs of its assembly bases there for several months. The big rubber plants which had almost ceased the manufacturing of balloons renewed and expanded that phase of their activities and balloon fields and schools were created or enlarged and newly equipped. The completion of the Liberty motor brought the later development of the flying boat, used especially for coastal patrol work.

Candidates for flying commissions were sent to technical institutions for special courses and afterward to flying stations for instruction in flying. The most difficult part of the problem of seaplane construction was that of finding skilled workmen and personnel for their direction acquainted with the making of aircraft. The same difficulty handicapped the procuring of trained officers and enlisted men for work at the supply and repair stations, which were constantly busy with the assembling and upkeep of the machines. To meet this difficulty half a score or more of schools for naval aviation mechanics were established in different parts of the country, with a force of instructors, who volunteered for the work, composed of professors in technical schools and colleges. From these schools came the trained mechanics and ground officers who filled the roster of the Naval Aviation Service at the end of hostilities.

The Navy Department saw at once that the most important aid its Aviation Service could give would be coast-wise work directed against the submarine menace. With that end in view it located its stations at strategic and important points all down the

eastern coast of the United States, eleven in all, from Cape Cod to Key West, with another in the Canal Zone. Similarly its patrol stations were dotted up and down the shores of France, the British Isles and the Azores. On both shores of the Atlantic its dirigibles and seaplanes helped to escort outgoing convoys and went far out to sea to meet those coming in, eagle eyes sweeping the waters to watch for and warn against the sea vipers. The dirigibles were especially useful in this convoy work, as they were able to keep pace with the ships.

In addition to this assistance in the convoy service the naval aviators ranged above the waters far out from shore, hunting submarines, looking for disabled vessels and for boats and wreckage carrying shipwrecked passengers and crews sent adrift on the ocean by submarine officers, and locating mines, and they carried on bombing operations by sea and land.

The first United States forces to land in France for service against the enemy belonged to the Air Service of the Navy, which set ashore there within a month after our declaration of war five naval air pilots and 100 enlisted men. From this beginning grew the nine seaplane, one training, three dirigible and three kite stations that dotted the French shores from Dunkirk almost to the Spanish border. Most of these stations were used for convoy work, for submarine hunting and for searching for mines and wrecks. But at Dunkirk was a station for bombing operations which made day and night attacks on the German naval bases and supply depots along the Flanders coast, with especial attention to Zeebrugge and Ostend. After the British blockaded the entrances to those places the naval aviators, American,

British and Belgian, coöperating in the work, dropped such a steady rain of bombs by day and night that the Germans were prevented from clearing away the obstructions. Two stations that were completed and in operation within ten months included a large aviation school and flying field at a lake near the coast, which specialized in bombing practice, and an aviation assembly and repair base with large machine shops and accommodations for the housing of their 5,000 men. The naval aviation stations along the French shores were so spaced that the entire coast line could be kept constantly under the observation of seaplanes and dirigibles. Some of the stations were located on uninhabited islets and others in tiny fishing villages on bleak peninsulas. This naval aviation force with its dirigibles and seaplanes coöperated so well with the sea patrol that between them they kept the whole of the French coast, for fifty miles from shore, safe from submarines through the last six months of the war.

The two naval aviation stations in Italy and that on the Islands of the Azores coöperated with the British and the Italian air patrols in the never ceasing hunt for submarines, the locating of mines, the watching for wrecks and the convoy of troop and merchant ships. Especially harmonious and cordial was the teamwork of the men of our six naval air stations in England and Ireland with the men of the British naval air service. The aviators flew together, they used each other's planes, coöperated in the guarding of the coasts and the convoy of incoming and outgoing groups of troop transports and cargo vessels, worked together upon perilous enterprises. Some of the most moving tales of daring adventure

and heroic endurance of the whole war narrate the deeds of these American boys who guided the wings of the navy over the coasts and waters of England, Ireland and France.

In the United States alone naval aircraft flew a distance of over 6,000,000 miles. On the other side, seaplanes and dirigibles aided in the convoying and protecting of 75,000 ships. Submarine hunting, which had a greater development than any other line of naval air work, reached a notable point of scientific exactness in its methods. Each patrol as it started out had mapped for it designated areas of the air of certain sizes and shapes and locations which it covered by following the directed courses by means of the compass. It is certain that many submarine attacks upon our shipping were thus prevented and that, by the dropping of bombs, several undersea boats were sunk. At the time of the signing of the armistice the plans of the Navy for its Air Service had not nearly reached the peak of development. But its effect upon submarine activities was already evident and it is probable that it saved in values of shipping that would have been destroyed but for its protection more than its development cost the Navy Department, which had expended upon it $100,000,000.

The Marine Corps, the Navy's landing force of fighting men, developed its own Aviation Service with both heavier and lighter than air craft, for flying above both land and water, which gave important assistance in several parts of the battle front.

CHAPTER XIV

THE TRAINING OF THE RESERVES

THE rapid, splendid expansion of the navy to more than sevenfold its former size brought its own big problems of how to prepare for a very specialized kind of life and duty young men having, as was the case with most of them, no sea tradition in their blood and but little previous interest in the naval affairs of their own country. In Great Britain there are hundreds of families whose names have been represented in the British naval roster, without the break of a single generation, for centuries. The very strength of the tradition draws the sons of these houses into the naval service by an insuperable attraction and from childhood attunes their minds and hearts to preparation for naval life and work. And everywhere in Britain pride in the navy is high and interest in it is keen.

No such previous mental attitude of a whole people made easy the problem of expanding the American navy and training its new recruits under the necessity of the highest possible speed. Pride and interest in their navy have always been potential rather than actual and constant among the American people. If it did something, in war or peace, that aroused their sub-conscious feeling about it they were quick and ardent in their response. But through year

after year the navy was something as foreign to the daily life and interests of the great mass of people in all that wide extent of inland country wherein lives the majority of the population as were the canals on Mars. Very few of them ever saw a battleship or a destroyer or a naval officer or a bluejacket and only an occasional picture, or newspaper headline, or magazine article reminded them at wide intervals of the American navy's existence.

Under such conditions, the quick response of the country to the navy's needs was one of the finest and least to be expected of its many achievements. From all over the country, Mid-Western and coastal regions alike, young men began to pour into the naval recruiting stations, and it is well within the truth to say that the majority of them came from homes and from regions in which the navy had hardly been even mentioned or thought about by any one from year's end to year's end. Moreover, they were mainly men of old American stock. The navy for this war did not become a fused mass of nationalities, as the army did, but returned to a condition even more thoroughly native-American than it had recently shown. Between ninety and one hundred per cent of the seamen of the enlarged navy were American born. The most of them were of that fine type of young men, educated and intelligent, who become, a little later, of consequence in their communities. In their training the fact that they had had no "sea legs" in their ancestry, or in their own minds and hearts, did not seem to matter in the least. They took to the training and to the life on the sea-washed, rolling decks of destroyers, chasers and other craft as ducks take to water.

The increase of over 400,000 in the naval personnel came partly through expansion in the permanent strength of the navy, partly through the enlargement of the various naval reserves, fleet, auxiliary, coast defense and others, and to some extent through the national naval volunteers and the Marine and Hospital Corps. In September, 1918, provision was made by which men in the selective service might enter the navy instead of the army. A quota of 15,000 men a month was allotted to the naval service, and 5,000 monthly to the Marine Corps for four months, after which its monthly quota was to have been 1,500. Provision for the navy was made, at the end of September, in the Students' Army Training Corps, under instruction in several hundred colleges, and naval sections were established in ninety of these institutions and placed under the instruction of naval officers.

But the sudden close of the war in November made unnecessary the completion of these plans for the further expansion of the navy. While increasing its size and strength at the swift pace that marked all our war preparations, at the same time it met every need for its services, of whatever sort, with promptness and efficiency. That had meant zealous and incessant work in the education for their new duties of more than 300,000 young men who had joined the Naval Reserve Force, in addition to those who had become a part of the naval forces in other ways. At a number of immense camps, where were built barracks, lecture halls and other necessary buildings for the housing and training of from 20,000 to 40,000 students at each station, the young men were trained in naval discipline and schooled in the maritime and

naval subjects in which they must be proficient. Special schools for officers gave to those who were qualified and ambitious the necessary instruction. Other schools for advanced and specialized work trained officers for submarine duty, for assignment to the naval torpedo station and for work as naval aviation and naval turbine-engine engineers. An intensive course of instruction at Annapolis Naval Academy completed the training for officer duty for many who had already had sea service.

The Navy furnished during the war to the United States Shipping Board 200,000 trained enlisted men, as well as 20,000 trained officers, to man its new ships, and the training for these men, in addition to that for fireman's and seaman's duty given at the regular naval training stations, was provided in nearly fifty different schools, from those for carpenters, cooks, yeomen, signalmen and divers, to those for mine sweeping, searchlight control and aviation aerography. On both ships of the Navy and naval-manned merchant ships sea-training constantly went on of those who had finished the courses at training stations, camps and schools, each ship of whatever type receiving its quota for a certain length of training in specified duties. Training bases in Europe for men who had already had some service aboard ship furnished material for refilling the crews of destroyers, part of whose complement had been sent back to this country to form the nucleus of new destroyer crews.

The taking over by the Navy, upon our declaration of war, of all radio stations, the constantly increasing demand for radio operators in the Navy and on merchant vessels in the transport service and in commerce made necessary greatly enlarged radio train-

ing facilities. Two large naval radio schools were developed, one at Harvard University and the other at Mare Island Navy Yard, each of which gave a four-months' course and graduated thousands of operators.

In all the naval training camps, stations and schools the utmost effort was made, as in the army training camps, to conserve the physical, mental and moral well being of the young men preparing for sea service. The activities and beneficence of the Army Commission on Training Camp Activities have already been described. Under the same head and working along similar lines the Navy Commission on Training Camp Activities busied itself with the welfare of the men fitting for naval service and provided them with books, sports, lectures, music, theatrical entertainments, moving pictures. There was the same endeavor to develop musical and dramatic talent and direct its use among the men. The cordial coöperation of the same civilian organizations that did so much to promote the welfare of the soldiers in training aided also in safeguarding the naval recruits and in adding to their pleasure. The thorough organization of athletic sports in all the camps, both outdoors and indoors, provided seasonal recreation in the way of football, baseball, basket ball, hockey, running races, boxing, wrestling, rowing and swimming. In the last named sport, when it was found that less than half the young men gathering in the camps were able to swim, instructors were added to the list of athletic directors and told to make sure that every man in the camp learned to take care of himself in the water.

PART ONE: SECTION III. IN THE AIR

CHAPTER XV

CREATING A NEW BRANCH OF WARFARE

THE United States had to create for itself, after entering the war, not only the new arm of air warfare almost from its very foundation, but also the industry for its development and support. Much controversy raged over the Goverment's air program and its progress during almost the entire year and a half and many and loud and long-continued were the charges of inefficiency, incompetence and failure. Mistakes there were, since human beings have not yet ceased the making of them, but when America's achievement in air warfare is considered in all its phases and as a whole the frank and fair judgment can not fail to be that her development of the air section of her fighting forces deserves to rank among the most notable of all her wartime achievements.

In April, 1917, this country had in the Aviation Section of the Signal Corps two small and poorly equipped flying fields, sixty-five officers, 1,120 men and less than 300 second rate planes, most of them for training, and there were ready for its use comparatively few of the many and varied manufacturing industries and the trained workmen necessary for the

development of an extensive war aviation program. Nor was there any one who had more than a vague appreciation of the complicated technique that would be required for such a development.

Although aviation had been born in the United States it had not received here the interest and commercial encouragement necessary for its growth and had had to betake itself to Europe to find the means and the opportunity for development. This lack of commercial interest had been reflected in the army and a conservative General Staff had given only the slightest consideration to the military possibilities of aircraft. Not until the summer of 1914 had an aviation section been incorporated in the army and there had been very little increase or betterment in its facilities during the following two and a half years. Even after our declaration of war an important aircraft participation was not contemplated by the General Staff until it was asked for by our war associates.

At the outbreak of the war each of the great belligerents was better equipped for air warfare than was the United States, just as they were better prepared for war in every way—war having been for centuries almost the normal condition of Europe, while wars had been few in America's short history. But even their planes were comparatively few in number, poorly equipped and of uncertain military value. Aircraft had quickly proved their importance and under the stress and competition of actual warfare there had been already wonderful developments in the size, horse-power, equipment and usefulness of the planes and in the skill of the pilots and the methods of training. But, because the needs at the front were ever changing and it was often necessary to discard

one week the successful achievement of the week before and constantly to reach out for new means and new methods, all this development was of less value to the United States than it would have been under more stable conditions. Any of it might have to be scrapped any day because of the developments of the day before. Moreover, so urgent was the need of England, France and Italy for every flier and every plane they possessed that, in justice to their own hard pressed battle lines, they could not offer as much assistance as they would have liked to give to the development of our rapidly planned air program.

That program was instituted in accordance with the urgent representations of the British and French war missions which came to this country soon after our declaration of war. The plans of the Allied forces, formed under the immediate and the clearly foreseen conditions of battle, called for great numbers of planes, pilots and mechanicians at the earliest possible moment they could be sent overseas. Therefore, the Government began at once to provide the industries and institute the training facilities necessary for the creation of this new branch of warfare. The development had to be from the foundation on both the side of production and the side of training. From the cutting of spruce trees in northwestern forests and the weaving of wing fabric to the making of the engines and the oil for their lubrication, the industry of airplane production had to be developed and speeded to the point where it would meet the desires of our war associates. This country had never trained an aviator sufficiently for participation in aerial warfare and it had neither schools, nor flying fields, nor fliers trained for teaching, nor a scheme of

instruction. Neither had it the mechanics necessary for the upkeep of training planes nor schools in which to train them. It had to begin at the beginning in all these things, and it had to develop industries and establish schools and prepare fields and train fliers all at the same time. One could not wait upon another phase lest the final result be delayed.

Nineteen months later, when the armistice was signed, the two small and poorly equipped flying fields had increased to thirty-six in the United States and seventeen in France, preparing students for all of the demands of aerial warfare. The sixty-five officers had multiplied to 10,300 flying men and there were 5,460 cadets in training and almost ready to be added to the number of those in the air, while there were nearly 8,000 officers in the non-flying divisions of the service, which contained also 133,600 enlisted men, trained for their specialized work. Within a year and a half the Air Service had been expanded from a beginning of little consequence to a size greater than that of the army in the years before the war and all of it had been trained in the technique of a new branch of warfare. In the production of aircraft and accessories 200,000 men and women were engaged, nearly all of whom had been trained for this skill-demanding work. There had been produced over 12,000 air and sea planes, more than 1,000 balloons and 31,800 aviation engines. During the last month of the war production, which had then reached a quantity basis, had mounted to the rate of 1,500 planes and 5,000 engines per month.

CHAPTER XVI

PROVIDING THE MEANS

SPRUCE and fir production in the forests of the Northwest for airplane stock was at once pushed forward. I. W. W. agitators endeavored to incite the men of the logging camps to cease work, disable machinery and injure stock. But they were driven away, the loggers and lumbermen of the district formed a Loyal Legion which was assisted by 30,000 enlisted men sent to the Northwest for this purpose, and production was increased to unprecedented figures. The output previously had never exceeded two and a half million feet per month. By the end of hostilities it had reached 25,000,000 feet per month and was still increasing in the effort to reach the goal, as it would have done very shortly, of a million feet per day.

To make this possible several railroads had to be located, the right-of-way cleared and graded and the roads built, all within a few months. One of them, reaching into two fine spruce districts, had thirty-seven miles of main line and twenty-three of spurs. The gravel for the ballasting of its tracks, nearly 5,000 carloads, had to be transported for a hundred miles. Part of the right-of-way had first to be cleared by hand power of huge trees amounting to a million feet of lumber per acre while other por-

tions were covered by thickets so dense they were impenetrable except as opening was made with axes. Half a dozen or more other lines penetrated far into the vast spruce and fir forests of the Northwest. Sawmills were built, great warehouses were constructed and all the cities of the West and Northwest were searched for the enormous necessary equipment of shovels, scrapers, picks, axes, tools of many kinds, steam shovels, pile drivers, horses. Substantial camps were built to house comfortably the thousands of workmen. A kiln-drying plant was erected to insure proper drying of the wood and economize freight charges upon the stock.

A total of 174,000,000 feet of spruce and fir was shipped out for airplane manufacture, of which a large part went to our co-belligerents. It was, indeed, seven months after our entrance into the war before any of it was sent to American factories, the Inter-Allied War Council thus directing the supply across the ocean because the need for airplanes was very great and they could be more quickly made and sent to the front in this way. Not until more spruce was produced than was necessary to satisfy their urgent need was any of it sent to our own factories. By November, 1918, enough spruce was being shipped out of the Northwest to meet the needs of all the associated nations.

For wing covering of airplanes linen had formerly been thought necessary, but the supply of linen was practically exhausted and there was none for the airplanes we must build. The Western Allies had been experimenting upon cotton materials for some time but had thus far produced no fabric possessing the necessary strength. A substitute for linen for the

wing coverings of our airplanes was an absolute necessity. American chemists and members of the Signal Corps had already been working upon a series of experiments upon cotton fabrics and they presently devised a method of treatment that made them as good as linen for this purpose and thereafter this substitute was used by both our war associates and ourselves. When the armistice was signed 1,200,000 yards of this material were being manufactured and treated per month. Castor oil was necessary for the lubrication of airplane engines, but the world's available supply was barely sufficient for the planes of our war associates and we would have to grow the beans and make the oil for the engines of our own planes. Castor beans for seed were rushed from India and planted by the thousand acres and machinery installed for crushing the beans and refining the oil. In the meantime, chemical experiments were being made for the purpose of discovering or devising a substitute. They were finally successful and an oil was produced that was equally good for all except the rotary type of engine.

Not only had the production of airplanes and engines to be provided for but a great variety of accessories of which the country had none was equally necessary. The aviators needed special clothing and equipment; for the battle planes there had to be mechanism synchronizing their machine-gun and propeller action, new kinds of ammunition, bombs and bomb accessories specialized for air combat; planes of all kinds had to be equipped with many kinds of gauges, meters and other instruments requiring the most delicate and exact work in their manufacture, and necessary also were cameras for air use and

camera guns for training purposes. The manufacture of all these and many other accessories had to be instituted and rushed forward and, because of the shortage in skilled labor and the need for it in so many kinds of war production at the same time, workers had frequently to be trained for the making of them. At the end of hostilities between three and four hundred manufacturing concerns, employing over 200,000 skilled workers, were supplying the various needs of this highly specialized branch of warfare.

While this preparation and development were going on ground schools and flying fields for the training of the personnel of the Air Service were being planned and built. For the study of airplane engines and of the elements of aviation and for military training arrangements were made with universities and technical institutions in various parts of the country and within a few weeks after the declaration of war young men were at work in "ground schools" at eight of these institutions.

This first step in the training required eight weeks and when the first students to be graduated from it were ready for primary instruction in flying the land for some of the flying fields had been acquired and tents set up. Here, under primitive conditions, they began their work, and kept it up while the fields were being developed underneath the wings of their planes. Construction proceeded rapidly and in a few months every one had its comfortable barracks for the cadets and men of the squadrons, shower baths, lecture buildings, mess halls, officers' quarters, long rows of hangars for the housing of the planes, and all the usual structures of a large cantonment planned and built

according to the principles of sanitary engineering and provided with telephone, electric lighting, water, sewage and garbage disposal systems. One of these fields, representative of them all, although they varied in size, with its hangars, machine shops, machine-gun ranges, landing fields, fire department and its many buildings, covered five square miles—more than 3,000 acres. As the system of training was evolved the fields were specialized and each one was developed according to the purposes for which it was used. In all, thirty-six flying fields were built in the United States, while in France several great air instruction centers, one of them the largest in the world, comprising in all seventeen fields, were prepared and in use when the war came to its sudden end.

America's war associates had developed a multiplicity of types of both planes and engines, with much resulting loss of economy both in production and in the training of the fliers to operate them and of the mechanics necessary for their upkeep. Profiting by this mistake, the Air Service of the United States endeavored to simplify types. The primary need was a standardized, high-powered motor that could be produced in quantity. Two or three engineers devoted themselves to this problem, working out in a few weeks the Liberty Motor, which proved to be a signal contribution to air warfare and to the possibilities of peace time aeronautics. It soon demonstrated its worth for all except the light pursuit plane and won the highest praise from our own airmen and from those of England, France and Italy. By the time it was ready for manufacture battle front needs had begun to indicate the necessity for a still higher horsepower and the making of these compli-

cated changes delayed its completion. The first contract for its manufacture was signed early in September, 1917, and when the "cease firing" order was passed along the battle lines over 15,000 had been turned out and quantity production at a rate of 2,000 per month had been reached, while 16,000 motors of other types brought the total to 31,800. The month of October had seen a total production of 5,600 airplane motors.

Advising with the air service officials of England, France and Italy, it was decided that this country could render the most efficient aid by specializing in battle and observation planes, rather than by attempting to produce all of the several kinds into which the developments of air warfare were specializing airplane uses. The types of foreign planes selected for these services had to undergo a certain amount of alteration to fit them for the Liberty motor and for other reasons, but when production began it proceeded rapidly, and over 3,000 were built, together with a large quantity of spare parts for repairs. Other types were being adapted to the American engine, which was considered the best engine for these planes, and new designs were being developed when the armistice was signed, and all of these would very soon have been in quantity production. American designers had been spurred to high pressure effort by the needs of the country and among the planes ready for testing, or already tested, approved and ready for manufacture, were several embodying original ideas that would have made them highly efficient as fighting planes. One of these was so simplified for the purpose of speedy production that it required but

one-tenth the number of parts of the ordinary service plane of European design.

The first necessity of our plane production was for training purposes, of which we had hitherto made only those for primary instruction. Deliveries of improved models of these planes began in June, 1917, but those for advanced instruction required longer for their manufacture. At the end of hostilities more than 8,000 had been provided. In a year and a half an airplane manufacturing industry had been developed and a total of nearly 12,000 planes had been produced, together with a large quantity of spare parts of every type, and there were orders outstanding for service planes to be ready for early delivery aggregating a value of $125,000,000.

In addition to the means for training flying men, there had to be provided a series of schools for the training of the non-flying officers and men of the Air Service. Engineer officers to direct the upkeep of the equipment, supply officers to keep it on hand in sufficient quantities, and adjutants to have charge of the records were all essential to the Air Service. All had to have a certain amount of training and, at first, schools were provided for each of these special needs. Schools or courses of instruction had also to be instituted for aerial photography, for radio work, for armament and compass officers. Another series of schools for mechanics was necessary in order to train men for the fifty or more trades necessary in the repair and supply shops of flying fields. Much of the work was new to American mechanics and demanded the greatest skill, care and delicacy of execution and in schools for this purpose intensive training was

given to them as rapidly as they could be secured. Many of these mechanics had also to be sent overseas, at the request of our co-belligerents, for service in their factories and flying fields, in addition to those who went to work in our own flying fields in France.

CHAPTER XVII

TRAINING THE MEN

GREAT as was the problem this country faced in the spring of 1917 on the material side of the creation of a new branch of warfare in the American Army—the construction of fields and planes, the development of industries and the procuring of skilled labor—even greater was the problem of working out a new system of training. We are accustomed to the creation of new industries and certain nuclei already existed around which this new one could be formed. We had trained a few civilians and soldiers to fly, but we had not trained an aviator, and had no means of training even one, for usefulness on the battle front. And we were urged to send overseas at the earliest possible moment 5,000 aviators schooled in the developments and the specialties which nearly three years of the hot-house growth of war aeronautics had brought about.

The British, French and Italian Governments detailed to this country, upon our appeal, a few expert fliers and teachers of flying to aid in the early development of our effort and cadets were sent from the United States to the flying fields of Canada, England, France and Italy to hasten their training. Some of these joined the flying forces of those countries and others returned after a few months to become in-

structors at our own hastily established fields. The few civilians and army men who had learned flying in pre-war days were at once set to work as instructors at the primary fields. The most apt of the American cadets, of whom many took to flying as do birds of the air and quickly became expert, were used as instructors at the home fields instead of being sent overseas for service. And so finally an expert and capable instruction personnel was built up and a system of instruction evolved that represents a work of such diligence, ingenuity, resource and enthusiastic and incessant effort as to make it one of the many memorable achievements of the war.

At the beginning of the evolution of the training system it was necessary to organize medical boards to pronounce upon the physical fitness of candidates. The requirements were rigid and the work was new and therefore the highest available medical skill must be obtained. Fifty or more of these boards were established and in the first year examined nearly 40,000 men, of whom almost half were unable to pass the severe tests. As the months went on, experience developed the methods of determining the applicant's physical fitness for flying to a remarkable degree of efficiency. The American system of training diverged somewhat, at its very beginning, from that of other nations, since it demanded a higher degree of scholastic attainment, a collegiate degree or a certain amount of collegiate work being a requisite, as it was believed that the mental development thus obtained would enable the student flier to advance more rapidly. As the system was finally developed, the candidate who had passed successfully the initial physical test had first a month of military training at a camp devoted solely

AIRPLANE AMBULANCE

AMERICAN FLYING FIELD IN FRANCE

to this work to give him due regard for discipline and for accuracy of statement in the making of reports, to inspire him with military morale and to give to his body and spirit a thorough testing in order that those who should fall short under its severe demands might be sifted out at the beginning.

Then came two months in a ground school, of which there were eight located in as many universities and technical schools in different parts of the country, where the cadet, under military discipline, received practical and theoretical training in the study of motors, airplane construction and other elements of aviation. By means of long hours and close application the young men did as much work during the two months spent at these schools as they would ordinarily have covered during an academic year. The next step was training at a field for primary flying under the dual control system and practice in solo flying until the cadet could pass the requisite tests which permitted him to be graduated as a Reserve Military Aviator, with the rank of second lieutenant. Then he passed on to other fields where he was taught advanced flying, acrobatics, night flying, formation flying and aerial gunnery, and afterward to a specialized field where he qualified to be a pursuit pilot and fly and fight his own machine, or to be a bombing or an observation pilot, or to do reconnoissance or photographic work.

At the close of hostilities fields for every specialty had been constructed and equipped and the system of training was receiving its final development in the establishment of brigades at a large flying center where the men were formed into squadrons, trained for work together and sent overseas as a flying unit.

The signing of the armistice found one such great center, ranking among the largest plants the United States had constructed for the prosecution of the war, almost completed, its several coöperating fields able to handle over 7,000 men at a time and turn out a steady weekly installment of air squadrons, each with its eighteen flying officers, five ground officers and 150 service, supply, construction and repair men, trained, organized and ready for the final two or three weeks of experience at the flying fields overseas before being sent to the front.

The system of training thus worked out had been evolved in the face of many difficulties. There were no text-books, no traditions, no bodies of accepted rules and methods. As finally developed, it was modeled somewhat on the British system, with important modifications and differences. But the passing months saw in it, as it evolved, many and sometimes striking changes. It was constantly in a fluid state, subject to the results of experiment and of observation upon the cadets in training, to the conclusions of instructors and field commanders after comparison of experience, and to the evolving ideas of scores of air service men. And especially was it subject to the information, suggestions and orders that came back from the battle front in France, where air warfare was being shaped daily and weekly by war conditions and demands into new methods and new developments. And the training on these fields four thousand miles away had to be kept closely in touch with these constant developments and imperious needs and its methods and aims changed from day to day, if necessary, to meet the requirements.

By experiment, observation, steady thinking at high

pressure and comparison of ideas on the part of every instructor, every officer and every cadet at every field, methods of instruction were hammered out for each phase of the work. Each field brought its offering of daily experience and almost every flight contributed something to the accumulation of facts out of which grew, finally, some surety of knowledge. Into the development of methods flowed a steady stream of ideas, discoveries, experiences and experiments, and so day by day the American system of training grew to better results and higher efficiency. Text-books, for the most part, were type-written or mimeographed accounts of results that had been gained the month, or the week, or the day before by following certain methods, with comments and suggestions as to their use.

Many contributions of value to the general theory and practice of training for flying were made by these enthusiastic young men who toiled unceasingly over the problems set by our training fields. One young lieutenant, while studying the causes of airplane accidents and trying to find some means of preventing them, worked out a series of exercises which reproduce the positions that must be taken in advanced flying and so enable the cadet early in his work to find out whether or not he is physically unfit to undertake acrobatic work and also give him a measure of preparation for it. Experiment showed that the motion picture film had possibilities for the flying instructor and when hostilities ended it had been drawn into the system of training and was beginning to be used to hasten and to make safer the cadet's progress. Sitting safely in his chair, he watched whirling horizons, skies and landscapes, pictured from an airplane

going through one acrobatic performance after another, noting the varving appearances of the pictures and his own sensations, and so having his nervous system educated in advance for what he would have to undergo, learning in time whether or not it would unduly affect him and gaining quickly and without danger valuable experience. An important development, worked out and used at American flying fields, was a series of tests of the flier's physical ability to endure high altitudes. Observation showed that accidents sometimes were the result of inability to endure rarefied atmosphere and by placing the student in a tightly closed room, gradually exhausting the oxygen and noting his reactions it was speedily determined whether or not it was safe for him to attempt high flights, either with or without a device for supplying him with oxygen.

The flight surgeon, specialized out of the army medical officer, was one of the early developments of training for air warfare and soon also there appeared, first devised and used at an American field, the flying ambulance, which enabled him and his assistants to go at once to the help of an injured airman, give him first aid and bring him back in the fuselage of the ambulance plane to the hospital. The end of hostilities saw at least one flight surgeon at every aviation training field in this country and several at each of the large ones. And there had been established a division of flight surgeons for which medical officers could receive a special course under the direction of the Medical Research Board of the Surgeon General's Office. The flight surgeon's duty was to keep every aviator under observation, to examine each one physically before and after flying, to note the effects of

flight, especially at high altitudes, to determine how frequently he should fly and to discover whether or not he had physical peculiarities which would unfit him for any special kind of air service. To aid in this work, which was producing remarkable results in the way of both efficiency and safety, there had been established at many of the flying fields research laboratories which worked out new tests and special and ingenious apparatus for using them and made examinations and observations of the airmen in training. Associated with the work of the flight surgeon was that of the athletic instructors who, toward the end of the war period, were appointed for service at the flying fields. They were former college athletes and athletic instructors who had received special training for the work of keeping the student aviators in the best possible physical condition.

These phases of the system of training that was worked out at American fields aimed to lessen the chances of accident and to gain greater speed and efficiency in the progress of the cadets. Throughout the war period the United States made a much greater effort to lessen the casualties of training than did any other nation. A longer period of work under dual control and more knowledge and skill before the cadet began solo flying were demanded by our system of training than other nations thought necessary. This and other provisions for the safety of the cadets made our training casualties less than half those of any other nation among our war associates. The record of American flying field casualties showed 278 fliers killed in training, an average of one to each 236,800 miles flown by cadets.

The system of training had not only to produce men

for work in the air. It had also to train large numbers for a great variety of work necessary to sustain and coöperate with the flying fighters and observers. In addition to unskilled labor, fifty-two trades and occupations are essential to the aviation service and men had to be either wholly or partially trained in each of them. At first, in order to secure skilled men with the utmost speed, mechanics were sent in detachments to a great number of factories where special training was given them and afterward, as experience began to disclose what would be needed, carefully worked out courses of training were established in nearly a dozen different schools. Government schools giving thorough training, in operation at the end of the first year of war, were graduating 5,000 mechanics every three months. Aerial photography had developed during the war to an exact science, but when we entered the conflict very little was known about it in the United States. Instruction in it was of a threefold character, for observers had to learn how to operate cameras in an airplane, intelligence officers on the ground had to be instructed in the interpretation of the results and enlisted men to be taught to do the developing, printing, and enlarging and to keep the equipment in condition. Schools for training in all these things soon produced the necessary instructors for the flying fields where training in aerial photography was given.

It was a complicated and difficult problem that the United States faced when it undertook to work out a system of air training while it was training the men for air service. But within a year and a half it had evolved an efficient system that set higher standards than did other nations and also better safeguarded

the lives of the men in training, and while doing this it had sent overseas 4,776 trained flying officers, had as many more at home fields, and had in training at home more than 5,000 cadets, of whom nearly half were in advanced stages of the work. In the final test of service at the front the men who had been trained by that system received for their ability, skill and deeds the heartiest and highest praise.

CHAPTER XVIII

THE BALLOON CORPS

THE division of ballooning gave important service, although it also had to be developed from a condition of little consequence. The few balloons of all types possessed by both the Army and the Navy were a small fraction of the number that would be needed. The balloon force consisted of eight officers and sixty enlisted men. The only school for ballooning had been rescued from complete abandonment a few months before we entered the war, but it had accommodations for only fifteen officers and 400 men, while its equipment was both obsolete and meager. A program of expansion in the balloon service was instituted and carried out that, in proportion, was comparable with that of the airplane service. Within a year and a half both Army and Navy were well supplied with all of the various types of balloons and up and down the coasts of the United States and of France and over our troops in the battle lines floated observation balloons manned by eagle-eyed watchers, dirigibles were aiding the coast patrols of both shores of the Atlantic and helping to escort troop and supply ships through the danger zone, kite balloons were giving constant and valuable service and balloons for the scattering of propaganda on and behind the enemy lines were undermining the morale of troops and peoples.

For training purposes the one existing school was modernized and enlarged and others were opened, great rubber plants revived the balloon making art, and at the end of hostilities the Army had over 1,000 and the Navy 300 balloons—dirigible, semi-dirigible, supply, target and kite—and the Balloon Corps of the Army contained more than 700 fully trained officers and 16,000 enlisted men, organized into 100 companies, of which 25 were in the battle zone. Plans were then under way to continue the expansion at an increased rate, for developments at the front were constantly making more useful the balloon of every type. To comply with this overseas need arrangements had been completed to increase the Balloon Corps by 1,200 officers and 25,000 men.

One of the most important scientific developments of the war was the result of the endeavor of the American Air Service to find a non-inflammable gas for balloons. Investigation and experiment by the United States Bureau of Mines found a new source for helium in a natural gas field in the Southwest, from which it could be produced so cheaply as to make possible its use for this purpose. Up to that time no more than a few hundred cubic feet had ever been obtained and its value was $1,700 per cubic foot. When the war ended 150,000 cubic feet of helium for balloon inflation had been shipped and plants were under construction that would produce 50,000 cubic feet per day at a cost of about ten cents per foot. As a helium filled balloon could not be destroyed by incendiary bullets it would be comparatively safe from enemy attacks and could carry on over the enemy lines operations of the greatest importance. Both the American and British governments had per-

fected their plans, when the armistice was signed, to use many dirigibles thus filled in air attacks from which immense quantities of bombs would have been dropped over strategic points in Germany.

Because of the assurance of safety which this non-inflammable gas gives to balloon operations, the usefulness of all balloons, but especially of the dirigible type, has been enormously increased and a new era opened for their service. Working upon the problem of making it possible to send propaganda balloons upon long journeys over the enemy's country, the meteorological service developed ingenious types of balloons that did remarkable work of that kind during the last months of war and, in addition, give promise of very great usefulness for the days of peace.

CHAPTER XIX

FLYING IN FRANCE

SEVENTEEN large flying fields, divided into seven or more air instruction centers, one of which was the largest in the world, were developed in France for the partial training or final grooming of the men who had already received part or nearly complete preparation at the home fields. During the first year of the war 50,000 enlisted men were sent overseas to rush forward the preparations for our air forces. Most of them went to France, where they made ready the big flying fields at the instruction centers, built assembly depots for American-made planes and, later on, aerodromes near the front. Others were formed into service squadrons and trained in England and France, in order to lessen the pressure upon our hastily developed facilities for such training, and were held in readiness for work with American pilots. Still others took the places in factories of French and English workers in order to release those who were more highly skilled for specialized work on airplanes and their accessories.

Hardly six weeks after the entrance of the United States into the war cadets began sailing for France for training at the French flying fields, in order to get our flying men upon the front at the earliest possible date. Within a year 2,500 young American

cadets had gone across the ocean or to Canada to seek instruction at French, English, Italian and Canadian flying schools. But the Allied nations found it impossible, under the staggering blows they were suffering, to furnish as many training planes as they had planned and many of these young men were not able to become effective at the front for a long time. But by the spring of 1918 some five hundred trained American aviators, organized in thirteen American squadrons, were working with the British and French airmen at the front.

It was early in May, 1918, that the first German airplane fell a victim to an American airman in the American service. In that month also the first planes from home were received by the American Expeditionary Forces and early in August the first complete American squadron with American built and equipped airplanes and working with the American Army crossed the German lines.

From various sources, including over 2,600 pursuit, observation and bombing planes furnished by the French Government to aid in the speedy equipment of our fighting forces, the American Army in France at the end of the war had a total of over 10,000 planes for pursuit, bombing, reconnoissance, experiment and training purposes. The United States had shipped overseas nearly 2,000 service planes and over 1,300 of these were at or supporting the front. In the battle zone at the signing of the armistice the American Air Service had 2,160 officers and 22,350 men, in the service of supply were 4,640 officers and 28,350 soldiers, while detailed with the French and British forces were 57 officers and 520 soldiers, making a total air strength of over 6,800 officers and 51,-

200 men. With the French army there were regiments of air service mechanics including 100 officers and 4,700 enlisted men. Under instruction at the fields and within two or three weeks of readiness for service at the front were pilots for pursuit, observation, and day and night bombing and observers, including artillery and day and night bombing, numbering all told a little over 2,000.

Previous to the time when America became an important factor in air operations, during the late summer and autumn of 1918, superior power in the air had wavered back and forth between the opposing forces. American built planes and American fliers added to the Allied forces the air power necessary to insure supremacy. More and more important during the last year of the war had become bombing operations from the air and the United States had been asked to specialize for bombing and reconnoissance work in both plane production and training of personnel. American air work was therefore largely of this kind and its contribution to the final defeat of the enemy, both in the destruction of enemy troops and material and in the undermining of morale, was of very considerable importance.

How important it was considered by our war associates is shown by the unstinted praise they gave to the ability, the skill and the daring of the American flying men. For their valor and achievements four hundred of those men received decorations. Over sixty of them were "aces"—that is, had received official credit for the bringing down of five enemy planes. The premier "ace" had twenty-six planes to his credit and the next highest had eighteen. Altogether, American fliers accounted for 491 enemy

planes whose destruction or capture was confirmed by the very strict evidence required before official credit for them was given and 354 others were reported without this official confirmation. Of enemy balloons the destruction of eighty-two was reported, of which fifty-seven had official confirmation. The American forces lost forty-five balloons and 271 airplanes. Therefore the American Air Service at the front destroyed more than three times as many planes as it lost and almost twice as many balloons. Among the flying men there were 554 casualties, of whom 171 were killed in action.

CHAPTER XX

AMERICAN CONTRIBUTIONS

AS a part of the American effort for effective prosecution of the war in the air, American skill, ingenuity, knowledge and determination in research solved some problems in air navigation and air fighting that will be contributions as important to aeronautics in peace time as they were in war, when they helped to turn the tide of battle against the enemy. The account of American achievement in the delivery of telling strokes would hardly be complete without a summary of these developments, discoveries and new applications of facts or methods already known.

Of great importance was the devising of the Liberty Motor, which met a keenly felt need for a high-powered engine for use in battle and observation planes and also made possible rapid production of motors in large quantities. Not only did this aid our war associates and hasten our own progress toward making our influence decisive at the front but it will have an important influence upon the commercial future of the airplane.

The discovery of a method for obtaining helium in large quantities at a low cost from natural gas will have results of the highest consequence for air navigation. Being non-inflammable it makes the dirigible

a safe means of transport by air and so greatly increases the possibilities of long distance flights above both oceans and continents. The propaganda balloons devised by the meteorological and other services of the United States were most useful in the dissemination of information in enemy countries, where the results were important in the undermining of morale. They also make possible the mapping of the air highways across the Atlantic and the observation of air temperatures and air currents—a service which will be of so much importance to the future of aviation that it can not yet be estimated.

The ingenuity and resourcefulness which found a means of treating cotton fabric to make it as good as linen for the covering of airplane wings made a contribution of signal value to American effort in the war, for without it our air program would have been completely balked. Other nations had attempted to solve the same problem and had devised cotton substitutes for linen, but none of them had proved equal to the strain which airplane wings must bear. The American process gave a substitute as good as linen, and better in some respects, and it has already proved a contribution of very great value to the building of airplanes for commercial purposes, for it simplifies the obtaining of raw material and lessens the cost of production.

Many problems connected with work in the air were under study by scientific experts in the army service when the armistice was signed and many smaller problems had been solved and contributions of less value had been made. Among them was the devising of a new and improved compass for air use; the developing of new and more serviceable cameras

for airplanes; the construction of a leak-proof tank for airplanes which lessens the dangers of flying; the devising of several kinds of ingenious signaling lamps for both day and night use. Several new types of planes were developed under the urgency of the country's needs that make important aeronautical advances.

One of the most important of all the airplane improvements of the entire war was the developing and the successful application by members of the Bureau of Aircraft Production to American airplanes of the radio telephone. It made possible voice communication between planes in the air and between the ground and the planes. For some time before the armistice was signed squadrons of American planes at the front were being maneuvered and fought by radio telephone and German orders had been insistent that an American plane thus equipped should be shot down and brought to the rear for examination. Important for war purposes as was this development, the result of months of investigation and experiment, its possibilities and its value for peace time uses are even greater.

Although not completed in time for war use, an invention for the control and direction by wireless from the air of boats and torpedoes in the water and of airplanes from the ground was mainly developed under the spur of war needs and its promise was high for decisive war usefulness, as it is also for peace-time purposes.

To create a new industry and bring it into quantity production; to work out a method of instruction and training; to train thousands of fliers in all the specialized branches of flying to a high degree of skill;

to train the tens of thousands of mechanics necessary for the upkeep and supply of a large aviation service; to bring that service up from a point of utter negligibility to a state of such efficiency and importance that it gave aid of high value on the Western front; and during the same time to make contributions of the highest consequence to air navigation—that is the summing up of America's achievement in the air, in a year and a half, for the prosecution of the war.

PART TWO

THE NATION BEHIND THE FIGHTERS

CHAPTER XXI

FINANCING THE WAR

STATISTICS of financial operations usually make dull and dreary reading for all who are not professional financiers. But every figure in the financing of our share in the great war glows with interest. For it is illumined by the high flame of patriotism and the eager wish to serve the needs and the ideals of the nation that animated the whole people. The story of the financing of the war is the story of the enthusiastic giving by young and old, rich and poor, high and lowly, all over the country, of all that their government asked in such overflowing measure as far exceeded its requests. Willingly they took up the heavy burden of increased taxes and gladly they carried to triumphant success four huge loans of government bonds, thus providing an enormous reservoir of credit that enabled the government to pay its mountainous bills, to give a helping hand to other nations, to bend all its energies to the prosecution of the war, and to carry the country over from a peace to a war basis without shock or financial disturbance.

The total cost of the war to the United States, down to the signing of the armistice, was, in round numbers, something over $21,000,000,000. The un-

avoidable continuation for a period of the expenses of the war establishment will have added $10,205,000,000 to that sum by the end of June, 1919, and the complete return of the country to a peace basis will somewhat increase that sum. However, a considerable portion, probably more than one-quarter, will be reclaimed from values gained or salvaged from the properties in which it was invested. Loans to the nations associated with us in the war, of which ten asked for credits, amounted, at the cessation of hostilities, to $8,000,000,000, and were increased by $2,000,000,000 more during the next six months. That sum will in time be removed from the country's net war expenditure. But $21,000,000,000 in excess of the nation's usual outlay for the carrying on of its governmental affairs had to be raised quickly and, for the most part, expended as soon as collected. The plan of the Government for financing the war provided for the raising of approximately one-third of this sum by taxation and from customs duties and other usual sources and the remainder by bonds and certificates maturing in from five to thirty years. Therefore the entire cost of the war will be born practically by those now living who as mature persons have been a part of it or who as children have witnessed or aided the work for it of their elders.

Accustomed hardly at all to direct taxation, the people nevertheless took up readily a war burden of income and excess profits taxes far heavier than anything they had ever dreamed of before. For the first time in their lives millions of people were called upon to make direct contributions to the support of the Federal Government. The sum of $3,694,000,000 raised by direct taxation was the largest tax ever paid

by any country and represented a larger proportion of the nation's war budget than any other belligerent engaged in the great war had been able to defray from tax revenues. About seven-eighths of this sum came from taxes on income and excess profits and the remainder from taxes on liquors and tobacco. Only about $22,000,000 of the revenue from incomes was paid by those having incomes of $3,000 or less, the bulk of it coming from large fortunes and excess profits.

The story of the four great Liberty Loans that preceded the signing of the armistice can never be adequately written. It is regrettable that it cannot be told in all its richness of enthusiasm and desire to be of service, its hard and willing work, and its lavish outpouring of money from men, women and children of every economic class and social condition who thus proved their determination to support the men in khaki who had gone overseas to maintain the integrity and uphold the ideals of the American Union. For if it could be told in all that fullness it would be one of those great stories of humanity that for centuries retain their vital spark and their power to thrill and inspire. A flame of passionate purpose swept the country and caught into its burning ardor almost every home in the land, whether on isolated farms, in remote mountain valleys, in thriving towns, on poor city streets, or on mansion-lined avenues. The nation asked the people to buy, in the four loans, a total of $14,000,000,000 worth of bonds, and they over-subscribed even this vast amount by $4,800,000,000. It was by far the greatest financial achievement ever carried through by any nation in response to appeals to its people.

The First Liberty Loan took place in May and June, 1917, when subscriptions were asked for bonds to the value of $2,000,000,000. There was an oversubscription of more than fifty per cent, amounting, in round numbers, to $1,035,000,000. But as the issue was limited to the amount offered none of the oversubscriptions could be taken. There were over 4,000,000 individual subscriptions, of which ninety-nine per cent were for amounts ranging from $50 to $10,000. There were only twenty-one subscriptions for amounts of $5,000,000 and over, and they aggregated somewhat less than $190,000,000.

The Second Liberty Loan occurred in October, 1917, the amount asked for being $3,000,000,000. The final returns showed an oversubscription of fifty-four per cent, or somewhat more than $1,617,000,000, half of which the Treasury Department was authorized to accept. The loan was taken by 9,400,000 men and women, of whom ninety-nine per cent, subscribing in amounts ranging from $50 to $50,000, took nearly two and a half billion dollars.

The Third Liberty Loan took place in April, 1918, opening on the anniversary of our entrance into the war, when bonds were offered to the amount of $3,000,000,000. These were over-subscribed by more than $1,158,000,000, the full amount being allotted by the Treasury Department. The number of subscribers was 18,300,000, of whom 18,285,000 subscribed for amounts ranging from $50 to $10,000.

The Fourth Liberty Loan followed in October, 1918, the request being for $6,000,000,000. The amount asked for equaled the combined requests of the Second and the Third Loans, all three occurring within one year. It was the largest single loan any nation,

at that time, had ever asked of its people and was described by the Secretary of the Treasury as "the greatest financial achievement of all history." No American can fail to feel that it was a privilege and a milestone in his life to witness and be a part of the patriotic fervor that carried it to a triumphant conclusion. The influenza epidemic that swept the country during the period of the loan kept many hundreds of thousands of people in sick-beds or sent them to their graves, disorganized business for many weeks, closed schools, churches, theaters, and all public assemblies in many places and everywhere interfered seriously with the progress of the campaign. Nevertheless, it was over-subscribed by almost $1,000,000,000. More than 21,000,000 people subscribed for bonds, thus making, if five persons be counted to the family, an average of a bond for every family in the country.

The rising tide of the nation's spirit was marked by the increase of subscribers from loan to loan. The number subscribing to the second loan doubled those to the first, and the third almost doubled those to the second, while the fourth made a huge leap forward of 3,000,000 subscribers beyond the third. The over-subscription to the Fourth Liberty Loan, all of which was allotted, was sixteen and a half per cent. As in the previous loans, the great bulk of the securities taken was in the smaller amounts, thus proving the almost unlimited extent to which the mass of the people, of small fortune, were willing to stand behind the government with their savings.

Their spirit was all the more notable because of the fact that the American people have never been accustomed to purchase government bonds and have

never sought, in any considerable number, bond investments of any kind. Each bond sale, with cumulative energy and enthusiasm that found their climax in the fourth, was made the medium of a great informative and patriotic campaign that sought to bring the meaning of the war, the aims and ideals of America and the imperative necessity of the winning of the conflict as soon as possible straight home to the heart of every American. Hundreds of thousands of workers talked and sang to assemblages and to crowds on the streets, carried on house to house canvasses, received contributions at booths in hotels, banks, public places of every sort. Cities and towns were gay with posters, banners and parades and the flags of America and the Allies floated from poles and housetops and windows. Soldiers returning from the front told the American people in hundreds of addresses why their money was needed for the men on the fighting lines. Trophies of war, captured from the enemy, taken over the country everywhere aroused enthusiasm. Artists gave their talent and skill in the making of posters that had nation-wide display. Men and women of prominence organized meetings and made addresses, and societies, newspapers and press associations aided in many ways. During the third and fourth campaigns it is estimated that not less than 2,000,000 men and women devoted themselves to helping the sale of the bonds.

The work done by the National Woman's Liberty Loan Committee, of which more detailed description is given in the chapter dealing with "The Work of Women for the War," deserves mention here because of the importance of its contribution to the success of the loans. When the committee was appointed by

the Secretary of the Treasury in May, 1917, it was made independent of all other loan organizations and given the status of a Bureau of the United States Treasury. It was a unique pioneer, for it was the first executive committee of women in the Government of the United States. When it was established the campaign for the First Liberty Loan was already in full swing, but it made a beginning, produced some good results and then bent its energies to thorough organization. It had a county chairman in practically every one of the thirty-two hundred counties in the United States, with 49,500 associate chairmen organizing subordinate units, and in cities, towns, villages, farming regions, mountain and desert districts, its members canvassed for subscriptions from house to house, by carriage, by motor, by horseback and on foot, in rain or shine, in mud or dust. In the Fourth Liberty Loan campaign there were nearly 1,000,000 working members of the Woman's Committee, every one of whom was busy as organizer, or canvasser, or both. In the Second Liberty Loan the organization was officially credited with the raising of $1,000,000,000 and in the Third Loan with a similar sum, while in the Fourth the Woman's Committee sold bonds to the amount of $1,500,000,000. The total contribution of the Committee to the three loans for which it worked was, therefore, one-fourth of the total asked for these three loans and only a slightly smaller proportion of the total subscriptions.

One of the most significant factors in the financing of the war was the contribution of the War Savings Societies. For what they gave was the result of small economies and of a thrift for which the American people have never been notable. Wasteful and

prodigal beyond any other nation, America, asked to economize for the sake of her soldiers, began saving pennies and nickels and quarters as nobody had ever dreamed she could, or would. The National War Savings Committee was appointed by the Secretary of the Treasury in December, 1917, and under it state, county, city and town committees were soon organized. All their members began preaching and practicing the gospel of thrift and asking men, women and children to save in every possible way and invest the results of their small savings and economies in thrift stamps costing twenty-five cents each. Sixteen of these stamps were exchangeable, with a cash payment of a few cents, for a war savings certificate redeemable in five years at a value of five dollars.

A nation-wide campaign of education for thrift and economy and of organization for practical result enlisted the services of many men prominent in business affairs. During the first three months of the campaign more than 18,000 incorporated banks and trust companies agreed to become authorized agents for the sale of war savings securities. The work spread all over the country, from Alaska to Panama and from Hawaii to Porto Rico. By the first of November, 1918, 150,000 War Savings Societies had been organized and hundreds of thousands of workers were selling stamps and aiding in the distribution of literature and the work of organization. More than a thousand periodicals gave free space to the advertising of the campaign, affording, approximately, a circulation of 55,000,000. Labor organizations and women's societies, schools, churches, clubs of many kinds, young people's organizations, the Boy Scouts being especially efficient, coöperated with im-

portant results. Thrift literature was placed in practically every school in the United States. The monthly cash receipts from the sale of thrift and war-savings stamps began with $19,236,000 in December, 1917, and increased with every month, reaching their highest point in the following July with $211,417,000. During the last ten days of that month the receipts were at the rate of over $7,000,000 for every banking day—enough to have financed the entire United States Government in the years before the war.

Up to November 1, 1918, the cash receipts from the sales of these stamps totaled $834,253,000, representing a maturity value of over $1,000,000,000. The achievements and influence of these societies were so remarkable and so beneficial that probably they will be continued and become a permanent factor in the finances of the nation.

Through the Bureau of War Risk Insurance of the Department of the Treasury the nation made generous provision for its fighting forces and their dependents. No other government had ever provided for them so liberally, nor had any other, not even excepting our own in previous wars, gone about the business in so just and so scientific a manner. Established at the beginning of the world war to insure the hulls and cargoes of American vessels against the risks of war, the scope of the Bureau was enlarged after our entrance into the conflict to include the personnel of the merchant marine and the officers, enlisted men and nurses of the Army and the Navy. It had also in its charge the compensation awards for death or disability to be paid to the men of these services or their dependents and the payment of allotments to their families. So enormous was the work

of the Bureau that it soon became one of the greatest of business enterprises and beyond question the largest life insurance concern in the world. It had written, at the end of hostilities, 4,000,000 policies totaling over $37,000,000,000 and equaling in amount the total life insurance in force at that time in all American companies, ordinary, industrial and fraternal, both at home and abroad. The maximum policy that could be taken out was for $10,000 and the average taken was for about $8,750. Premiums to the end of the year amounted to $630,000,000. At the signing of the armistice the Bureau was issuing checks for compensation awards, allotments and insurance averaging a million per month in number and calling for the payment of a million dollars a day. It then had on file 30,000,000 individual insurance records of various kinds and, in addition, there were afterwards brought from France twenty-six tons of such records of insurance issued after the men had gone overseas.

The enormous amount of work done by this Bureau was only one factor in the wartime expansion of the duties of the Treasury Department that brought about grave problems of administration. Thousands of new employees were needed for the vastly increased work of the Internal Revenue Bureau, with its new phases due to the inauguration of direct personal taxation, and thousands more for the work of the War Risk Insurance Bureau, the new tasks of each Bureau calling for special skill. The Insurance Bureau had 13,000 employees, recruited and trained in a year. Other expansions made necessary still more thousands of workers. Office space for them and for the records that must be kept had to be provided, the

employees had to be found and the greater part of them had to be trained for their special tasks. The problem of training was met by establishing schools within the Treasury Department in which intensive work prepared applicants for their duties in a short time.

CHAPTER XXII

THE BRIDGE OF BOATS

THE primary need of this country when it entered the war was that of ships. The necessity was urgent and it was evident that they would have to be provided in constantly increasing number by dozens and scores and hundreds, for a great army would have to be ferried across the Atlantic, with munitions in enormous amount and mountains of supplies, equipments and food. Unless a bridge of boats could be thrust across the ocean, and it could be renewed as fast as destroyed by submarine warfare, nothing that this nation could do in the prosecution of the war would be of the least value, for all her effort would be paralyzed. The enemy was depending upon submarine operations to paralyze that effort and was confident it could be done.

The U-boats were sinking ships in 1917 at the rate of 6,000,000 tons a year, and destruction had so much exceeded construction that the world's supply of shipping had been greatly depleted. What remained was not sufficient to meet the already existing needs and the submarine inroads upon it were steadily lessening its tonnage. Therefore the United States would have to build ships, and more ships. If the submarines sunk them, more would have to be produced to take their places. And so the production

of ships became for America the primary and most pressing problem of her war effort.

But for many decades America had not been a ship building nation. When she entered the war her ships were carrying a little less than nine and seven-tenths per cent of her own imports and exports. In the whole country there were only sixty-one ship-yards, both steel and wood, totaling 235 ways. About three-quarters of the capacity of the steel ship-yards, of which there were thirty-seven, had been already preëmpted for the essential expansion of the navy, and many of the wooden yards were unfit for modern ship-building. Less than 50,000 men were working in these yards, their number representing, probably, the sum total of the workers in this country whose industrial training had prepared them for ship-building tasks. And among the men accustomed to the organizing and carrying through of great construction enterprises only a scant few had had experience in the building of ships. They had built railroads and engines and cities and bridges and dams and machinery, but not ships. In short, the country was so scantily supplied with the facilities, the experience and the skill needed for the production of ships as to be next door to destitute of them. And ships were its primary and most urgent need.

The nation sprang to meet that need with energy and determination. There were at first delays and faulty organization and disagreements that interfered with the early progress of the work and at the time greatly irritated the country. But at the signing of the armistice the sixty-one shipyards had been increased to more than two hundred, all at work upon steel, wood, or composite ships, the 235 ways had

grown to over 1,000, and nearly 400,000 workers were building ships, with 300,000 more in the essential allied trades.

At that time some of the largest shipyards in the world were in the United States, their sites having been transformed in one year from waste land to huge industrial plants already producing ships. By the end of 1918 there had been built, delivered to the Shipping Board and put into service 592 vessels of a total dead-weight tonnage of 3,423,465 and there were under construction steel ships amounting to 3,600,000 tonnage and wood vessels aggregating 1,200,000 tons. Within the jurisdiction of the United States Shipping Board there were, at the beginning of September, 1918, including chartered foreign vessels, 2,600 sea-going steam and sailing vessels of a total of 10,334,000 dead-weight tonnage. A part of this total had been gained by the requisition of ships under construction or contract by American ship yards and speeding up work upon them. In every yard effort was intensified, resulting in one case in three times the deliveries of the previous year. To October 1st, 1918, 255 of these requisitioned ships, of which the keels of only about twenty per cent had been laid when the Fleet Corporation took over the contracts, had been delivered, their tonnage amounting to 1,500,000. A few ships were built in other countries for the United States. Enemy vessels in American ports at our declaration of war were seized and put into American service after the damage inflicted upon them had been repaired. These totaled about 600,000 dead weight tons. Other enemy vessels interned by neutral governments were purchased. More than 300 vessels of about 1,000,000 tonnage were

chartered during the year for varying periods from associated and neutral governments.

Thus did the United States Shipping Board Emergency Fleet Corporation, the organization through which the Government functioned in the management of the shipping situation, reach out in every direction and secure every possible ship to aid in building that vitally necessary bridge of boats across the Atlantic. With the help of the Allies the bridge was built and, guarded by the British and American navies, it was able to carry with triumphant success all the men and materials of every sort, in all their vast amounts, that were needed.

But the special achievements in ship construction of the U. S. Shipping Board Emergency Fleet Corporation deserve more extended mention, for it had built over sixteen per cent of this entire fleet. It devised a new scheme for the rapid production of ships, that of the so-called "fabricating" shipyard. So enormous and so urgent was the need for a large tonnage output that beside it existing facilities were negligible and too much time would be needed for the construction of enough shipyards of the ordinary type. So, while every effort was put forth to renovate and enlarge existing yards and build new ones, several huge yards were constructed for the assembling of the parts of steel ships after they had been made in steel structural works. A ship was designed with simple lines, flat decks and few curves, the design standardized and production of the parts begun in many plants while the building of the big yards was rushed. One of these, having twelve ways for 9,000 ton ships, laid its first keel five months after the signing of the contract for the building of the

yard; another, having fifty ways for 7,500 and 8,000 ton ships, laid its first keel, when the yard was half completed, in five months; and another, with twenty-eight ways for 5,000 ton ships, laid its first keel in three months.

These three yards, each of which was built and operated by a contracting company, represented an investment of almost $100,000,000. They were equipped to turn out, together, 270,000 tonnage per month, which is more than the tonnage of all the steel ship yards in the country had produced in any entire year for the last previous nine years. These large yards had begun to come into production only a little while before the signing of the armistice. One of the plants included 139 acres, all of which was waste land, overgrown with weeds and brush, when the company signed its contract in September, 1917. A year later its twenty-eight ways were completed, a ship was under construction on each one, fourteen ships had been launched and one had been completed. Docks, railway sidings, shops, offices, had been built and huge stacks of ship-building material covered the ground. A big, four-sided bulletin board, on which was posted each day the progress of every ship on its twenty-eight ways, voiced the spirit of the workers and the management in a slogan across its top that proclaimed the purpose, in letters that fairly shouted, "Three ships a week or bust!"

Another of these fabricating yards, whose site was chosen because of its nearness to industrial centers and easy accessibility, was located on an island that was an uninhabitable malarial marsh in September, 1917. It was first taken in hand by sanitary engineers, drained, cleared of mosquitoes and flies and

put into sanitary condition. Then the plant, covering 846 acres, was built, its fifty ways extending for a mile and a quarter along the water front and its piers having space for twenty-eight vessels, so that seventy-eight ships could be in course of construction and outfitting at the same time. It had eighty miles of railroad track and 250 buildings of various kinds, including a hospital, a hotel, a Y. M. C. A. building, a cafeteria and a trade school. The yard laid its first keel in five months and launched its first ship in less than eleven months from the date of the first stroke of work on the island marsh.

Existing shipyards enlarged their facilities and speeded their work and new ones rushed their ways to completion and began laying keels and driving rivets at the earliest possible moment. In the summer of 1918, 280,000 laborers were engaged on shipyard construction. In a little more than a year 400,000,000 feet of yellow pine lumber for the construction of wood vessels was cut in American forests and transported to shipyards in the Atlantic and Mexican Gulf coastal regions—enough to lay the floor of a bridge twenty-five feet wide from the United States to France. As much more pine and fir lumber was cut for the construction of vessels in Pacific Coast yards. In one month, September, 1918, 15,000,000 feet of yellow pine lumber was used in the building of houses for shipyard workers.

On the Great Lakes, when we entered the war, there were fourteen shipyards with seventy-five ways. The signing of the armistice saw twenty-one yards in that region, with 110 ways, and fifteen more ways under construction. These Great Lakes yards, when the Shipping Board took charge of the shipping program

in August, 1917, sent at once a fleet of twenty-one steel vessels which had been used in lake commerce down the St. Lawrence for the government's use on the ocean. Some of them had to be cut in two to enable them to pass the canal locks, and were then welded together again and soon steamed out of the river's mouth loaded with cargoes.

A world record of rapid work was made by one of these Great Lakes shipyards which launched a 3,500 ton steel freighter seventeen days after the keel was laid and at the end of seventeen more days delivered the ship to the Shipping Board complete and ready for service. During the fourteen months from the time when the Shipping Board took charge of the shipping program until the end of hostilities the Great Lakes shipyards sent to the ocean a fleet of 181 steel vessels aggregating over 600,000 deadweight tons, which was twice the record prewar output of sea-going ships of 1,500 deadweight tons and over. On the Pacific Coast one shipyard made another world's record with a wooden ship of 4,000 tons which was launched seventeen and one half days after the laying of the keel and was ready for the sea in eight days more. The Pacific Coast yards built, to the end of September, 1918, 137 vessels totaling over a million deadweight tons.

Delivery of completed ships was often delayed by lack of boilers and other fittings, the manufacture of which had sometimes to wait for steel upon other war necessities. Nevertheless, as yard after yard began to show the results of the speeding of construction, the monthly tale of ships grew by mighty leaps. In August, 1918, at the end of a year, it passed the record monthly production of British ship-

yards, which previously had built a larger tonnage than all the rest of the world combined. It kept the lead and broke its own record the next month, and that one also in October when seventy-eight ships of 410,865 deadweight tonnage were delivered to the Shipping Board ready for service—a tonnage in one month exceeding by more than 100,000 tons our greatest annual pre-war output of sea-going vessels.

During the twelve months ending September, 1918, the sea-going tonnage built in the United States aggregated a tonnage equal to 70 per cent of that built in the whole world in 1913, the year before the outbreak of the world war, which until 1918 was the highest total of ship production in any year in the history of ship-building. The total number of merchant vessels under construction throughout the world, excluding the Central Powers, at the end of 1918 was 2,189 ships of 6,921,989 gross tons, a little more than double the largest corresponding tonnage under construction by the world before the war. Of that total the United States was constructing 997 vessels of 3,645,919 gross tons, or almost half the number of vessels and more than half the tonnage.

The official records of the Bureau of Navigation of the Department of Commerce show that there were constructed in the United States during 1918 821 sea-going vessels of 100 gross tons and over totaling 2,597,026 gross tons, an unprecedented total for any country in the history of ship-building. Lloyd's Register accords the highest previous total of ship production for any one year to the United Kingdom, whose shipyards launched in 1913 1,932,153 gross tons of vessels of 100 gross tons and over. The ship production of the whole world during that year was

3,332,882 gross tons of vessels of 100 gross tons and over. The construction of sea-going vessels in the United States during the last six months of 1918 was at the rate of 3,600,000 gross tons a year.

On a single day, July 4th, 1918, there were launched in American ship-yards for the United States Shipping Board 95 steel, wood and composite vessels of 3,000 deadweight—approximately 2,000 gross—tons and over, totaling 474,464 deadweight, or approximately 316,310 gross, tons. And in the month of October there were completed and delivered to the Shipping Board vessels of 2,000 gross tons or over totaling 283,652 gross tonnage, which exceeded by nearly 100,000 gross tons the highest output of vessels of 100 gross tons and over for any month in the ship-building history of any other country.

From being almost a non-ship-building country the United States had sprung in a year and a half to the position of world leadership in ship construction.

The whole nation hung with eager interest upon the progress of the shipping program and during the first summer of our participation in the war, when it was being hampered by disagreements and delays, there was much anxious protest. The unprecedented winter of 1917-1918, with its bitter weather, shortage of coal and railroad congestion, also interfered with the forward movement of shipping affairs. But when at last it began to be manifest that the urgent need for ships would be met the country threw itself with enthusiasm into a helping attitude. Business and professional men took their vacations in shipyards and in overalls with sleeves rolled up they offered whatever aid, whether mus-

A Shipyard in the Making

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The Fifty Shipways, Each with a Ship in Construction, of the Same Yard One Year After Work Began Upon It

cular or mental, was in their power. Hundreds of college students joined the army of shipyard workers. Business firms offered prizes to stimulate the speed of riveters, among whom were made some world's records.

In line with the government's purpose to carry on its entire war effort in harmony with democratic aims and methods, a systematic program of education was instituted by the U. S. Shipping Board Emergency Fleet Corporation, whose chief purpose was to increase the efficiency of the workers by enlarging their vision and appealing to their intelligence. In every shipyard stirring talks gave the men information, which many of them at first lacked, about the meaning of the war, why America had entered it, what would be the significance of victory and of defeat to them and to the nation, why the ships were needed and what the labor of each of them meant to the battle lines across the ocean. These talks made the shipworkers see that, under the emergency, to build good ships as rapidly as possible was to give a great service to humanity. The program was well organized and hundreds of speakers—soldiers, ministers, professors, business men—addressed shipyard meetings, explaining, urging and inspiring. Effective posters in every yard gave pictorial point to their message and kept it constantly before the eyes of the men. Pamphlets and circulars were distributed among them that told them in direct and vigorous language the significance and importance of their work. The plan met with signal success and from week to week could be seen a steady growth of enthusiasm and determination, while improved morale and new ideals of citizenship were also evident.

Skilled shipyard laborers were few in number compared with the need for the army of them that sprang out of our entrance into the war. Some new method of training had to be devised that would quickly prepare green men for capable and efficient service. The same idea of intensive training that proved successful in the preparation of officers for the army and of instructors and workers in many branches of war effort was applied to the shipyard problem. Training centers, which finally averaged two for each of the eleven ship-building districts, were established, each with a staff of instructors composed of men who had had both technical and practical experience and also training in effective teaching methods. To these centers were sent bright mechanics, selected for their ability and promise. After a stiff six weeks' course, each in some special ship-building trade, they were returned to their respective plants, where they joined the yard's own training staff and aided in the turning of green men into skilled laborers. Training schools to develop efficiency in the instructors of the training centers were also established, in order to make sure that the right kind of training would be given to the mechanics from the shipyards. Special courses were instituted at these training centers for men who wished to advance and broaden their capacity by gaining a knowledge of allied branches of work. Most of the yards organized training departments of their own which utilized all the assistance they could get from the training centers and also made use of skilled and capable mechanics in their own employ by having men trained in teaching methods instruct them in the art of showing others how to do things and then putting unskilled men into their charge. These methods

of intensive training proved to both managers and workers that by them skilled labor in large quantities can be quickly provided.

Safety engineering work aiming to secure and maintain better and safer conditions of working and to enlist the interest and coöperation of the employees had such good results as to reduce materially the percentage of accidents. This went down from the average for ship-building of twenty-two per cent before the war to as low as six per cent in one large plant.

Shipyard publications had much to do with creating a fine community spirit, instilling patriotism, broadening outlook and inspiring the workers with zeal for the job in hand. The Health and Sanitation section of the U. S. Shipping Board Emergency Fleet Corporation carried on a vigilant campaign to protect the health of the shipyard workers by making sure of a pure water supply, endeavoring to protect them from epidemics of disease, doing away with unsanitary restaurants and lunch rooms in the vicinity of the plants and combating by education and medical clinics the scourge of social disease.

The assembling of such large numbers of men as were needed by each and every one of the American shipyards for the country's program of ship-building produced, for most of them, a housing problem that was almost as difficult and imperative as was the building of the sorely needed ships. It was an acute emergency and to meet it the United States Shipping Board Emergency Fleet Corporation was authorized to expend $75,000,000. When the cessation of hostilities came it had built or was building dwelling houses, apartment houses, dormitories, mess halls, boarding houses and other such structures to the

value of $64,000,000 and had enlisted the coöperation of municipalities and public utilities companies. In some cases the increase in workers was absorbed by adjacent cities and in others it was sufficient to erect dormitories and cottages in nearby towns. But in several it became necessary to create new towns, upon newly selected sites, and to build at high speed homes and streets and all the many structures necessary for a community of ten thousand or more people. The aim in the building of these towns was to create permanent and attractive homes provided with the necessities and comforts of modern civilization,—well built and lighted streets, provisions for fire and police departments, churches, libraries, schools and theaters,—such as ordered, contented and intelligent communities desire. Some of the best architects and housing experts in the country contributed their services in the making of the plans for these towns, in which building went on at the rate of twenty or more houses per day.

It was no small part of this huge shipping program to provide officers and crews for the ships that were sliding from their ways with increasing rapidity. For, along with the decrease in ship-building, Americans had lost interest in sea service. It was necessary to begin at once the recruiting and training that would man and officer the new ships. Within two months after we entered the war free navigation and engineering schools had been started, and when hostilities ended more than 6,000 men had been graduated, of whom over 3,000 had received officers' licenses while many others had entered the navy. And in the dozen or more mammoth Naval Reserve Training Stations established and conducted by the Navy

Department many thousands of young men were trained for service in all capacities in the merchant marine.

In so enormous an undertaking, entered upon with such scanty facilities and carried on under the stress of such urgent need, it was inevitable that the outcome should not always have equaled the hopes and desires of the country and that the zealous efforts and patriotic purposes of those engaged in it should not always have won complete success. But it was an achievement, within a year and a half, of plants enlarged and constructed for the building of ships, of labor trained for that building, of ships built and put into service, and of men trained to officer and man the ships that was a potent factor in the winning of the war. It was an immense and rapid industrial development made possible only by the ardent cooperation of all the factors of the entire national life necessary, under the emergency, to bring it to success.

CHAPTER XXIII

ORGANIZING THE NATION

PRECEDING and following chapters show how important a part organization played in the separate phases of civilian support of the war. In every line of war effort there was voluntary and spontaneous team-work on the part of all especially interested individuals who steadily coöperated with and formed a part of the nation-wide organization of that division of national life. The Food Administration and the Fuel Administration organized, each for its special work, the whole country and brought its own organization into touch with the people of every county and every community in the United States. The financing of the war evolved its own formation of a network of committees covering the land for the sale of bonds and stamps. So also in the mobilizing of industry for the support of the war each division of interest drew together in patriotic coöperation and all combined in voluntary team-work. A wide-spreading organization, inspired and held together by love of country, worked here, there and everywhere to aid in clearing the land of enemy spies and propaganda. Women linked up their existing organizations more closely and created new ones for more efficient work in all of the many kinds of war service which they undertook. Even the upholding of the fighting forces

by thought and effort for their welfare and happiness was effectively organized. And so on, through every phase of civilian support of the war, the universal individual eagerness to do everything possible was organized into a systematic, effective coöperation that was comprehensive in its scope and was directed by able leadership along definite policies which converged into the one purpose of applying that mobilized effort to the prosecution of the war.

These were separate organizations, each devoted to its own purpose. But interlocking them all, partly by virtue of having conceived and launched many of them and partly by reason of its own purpose, bringing them all into efficient and harmonious cooperation and at the same time aligning the entire country in one vast organization that practically put the whole nation into one huge civilian army working for the support of the fighting forces, was the Council of National Defense.

Created by an act of Congress in the late summer of 1916, the Council of National Defense was not fully organized until March, 1917, when our entrance into the war had become inevitable. In the creating act the Council was charged with the "coördination of industries and resources for the national security and welfare." It was to consist of the Secretaries of War, the Navy, the Interior, Agriculture, Commerce, and Labor and it was directed to nominate to the President an Advisory Commission of seven persons, each having special knowledge of some industry, public utility or natural resources, or being otherwise specially qualified to give aid and counsel in the stimulation, development and coördination of national activities and "the creation of relations which would ren-

der possible in time of need the immediate concentration and utilization of all the resources of the nation."

Primarily the Council of National Defense was an organizing machinery. It took into its hands the universal eagerness to serve of all the millions of the American people in civilian life and created for them the emergency means by which each and all could join the vast and immediate mobilization of resources and of effort that was necessary. At once it summoned to Washington for conference and the starting of coöperative effort the leaders in science, engineering, industry and other phases of national life. Under this exchange of ideas there was a rapid evolution of plans that were quickly put into operation under its auspices. As they proved workable and grew in importance some were turned over to existing agencies for administration and others developed into separate organizations. But all were so interlocked that they marched forward with harmonious step, each coöperating with and aiding the others.

The coöperation among industrial leaders for the mobilizing of the country's material resources for war production which was at once instituted by the Council developed later into the War Industries Board, the story of whose work for the war is told in the chapter dealing with "War-Time Management of Trade and Industry." The Council initiated also the work of stimulating production for aircraft needs, of speeding coal production, of interesting the people in food conservation and of drawing the railroads together into a national transportation policy. Its Committee on Labor drafted the War Risk Insurance Bill, initiated the undertaking and then turned it over to

the Treasury Department. The policy of price fixing, which finally developed into a definite organization under the War Industries Board, had its beginning in the informal voluntary agreements entered into between members of the Council in the early days of its existence and representatives of industry. So also the priorities policy, which afterwards became a most important and efficient means of controlling trade and industry and bringing them into direct and effective war service, began with voluntary agreements between leaders of industry and commerce and the Council in the early days of the war. Its Commercial Economy Board, which afterwards became the Conservation Division of the War Industries Board, did a comprehensive and most essential service in the planning and instituting of economical policies for industry of nation-wide application that would release material and labor for war production uses. By the principle of voluntary coöperation which it inspired, initiated and organized into the war machinery of the Government the Council largely eliminated the possibility of profiteering in connection with war effort and so helped to make the conducting of the industrial phases of this war, enormously increased though they were in both magnitude and possibilities, incomparably more honest than it had been in any previous war in which the country had ever engaged.

The Department of Science and Research of the Council of National Defense did particularly valuable work in getting together the scientific and technical men of the country and so organizing and directing their knowledge and skill and their ability in research as to form a war resource of inestimable

value. Its membership included a large part of the men representative of the scientific, technical and engineering achievement in the United States and through this Department of the Council their services were at the call of the Government whenever needed. Through its General Medical Board the Council aided in the mobilization of the medical personnel and resources of the country. Its Committee on Engineering and Education brought together the best thought and skill for the solution of engineering problems in connection with the war and for the aligning of educational institutions and facilities behind the country's war effort. Its Committee on Labor, besides drafting the war-risk insurance bill and initiating that undertaking and aiding in the development of the plan for the War Labor Administration, did valuable work in helping to maintain hearty coöperation between the labor movement and the national war policies by promoting the welfare of industrial workers and by providing a system for the rapid and intensive training of mechanics. Its Highways Transport Committee coöperated with the War Department in facilitating the work of its important motor-truck convoy service, developed rural motor express routes, instituted a movement for the better development and care of highways and assisted the Railroad Administration in its early struggle with the congestion of freight.

As an organizing machinery and provider of means by which the whole nation could be brought into cooperation for war effort swiftly and efficiently, the Council of National Defense did not confine itself to the material phases of the country's resources but also helped the national spirit to find adequate ex-

pression. To that end it organized a great, nation-wide system by which the war machinery was synchronized to harmonious work through every smallest section of the country and through which the national spirit was enabled to find expression in effective action. Under the State Councils Section of the National Council of Defense within a few months there had been organized in every state of the Union a State Council of Defense whose function was to centralize and coördinate the war work within the state, to coöperate with the work of the National Council, to inaugurate whatever new work local conditions rendered advisable and to create and direct local councils. County councils were organized in every county of each state and within most of the counties community councils, usually with the school district serving as the unit, were formed. These community councils were not committees, but were the community itself, with all its citizens and agencies organized for coöperative, effective, national service. It was a neighborhood democracy made effective by organization and it established a direct means of reciprocal communication between the Government and the masses of the people. An immense and closely woven network thus overspread the country consisting, under the State Councils, of 4,000 county organizations, 16,000 women's divisions and 164,000 community and municipal units, extending through the wards of cities, through towns and villages, across farming countrysides. The Woman's Committee of the Council, described at more length in the chapter on "The Work of Women for the War," collaborated constantly, organizing the women of every community for any sort of war work they

could do. While the functioning of the Councils, State, County and Community, was kept flexible and responsive to local initiative and local conditions, their most important work was that of translating into action those war policies of the Government that called for the coöperation of the people. Through them were made effective such nation-wide movements as the conservation of food and coal, the increasing of food production, the mobilization of industry, the selling of bonds and war stamps, the marshalling of labor, while there was hardly a war effort of the Government of any sort in which they did not give aid. So remarkable and important has been this unifying of the nation by means of the system brought into life for war purposes by the Council of National Defense that it is likely to remain as a permanent and useful feature of the life of the country in the coming years of peace.

Throughout all the many services of the Council of National Defense during the war, its organization of war machinery, its mobilization of material resources, its bringing together of leaders in all phases of national life and showing them how they could aid the country, its vital work in enabling the humblest individual, and all the individuals in the nation, to become efficient in action for the war, the two most conspicuous features are, the voluntary character of all the effort and the universal willingness of the equally universal coöperation. Of all the vast and varied services which it commanded, from captains of industry and leaders of science to the committee heads in little country towns, practically all, except those of its office staff and clerical assistance, were given gladly to the nation for the sake of

love of country and belief in American ideals. And the result proved, in the words of President Wilson, "beyond all question that the highest and best form of efficiency is the spontaneous coöperation of a free people."

CHAPTER XXIV

INFORMING THE PUBLIC

AMERICA fought ardently in the world war because of the devotion of her people to democratic ideals. Since one of those ideals is to base the participation of the people in public affairs upon a knowledge of those affairs as complete and accurate and universal as the limitations of human nature and human institutions make possible, it was necessary to provide some machinery that would serve as a means of communication between the purposes and the vast undertakings of the Government, functioning for the people, and the people themselves. In common with the spirit and the methods by which all the war activities were carried on—spirit and methods which strikingly exemplified one of the fundamental traits of the national genius—the situation was met by creating an organization for the widest possible spreading of information about the national needs, activities and aims. The Committee on Public Information, created by an executive order of the President soon after our declaration of war, began with a civilian Chairman and the Secretaries of State, War and the Navy as its members. At the close of hostilities it had a world-wide organization which commanded the services of thousands of authors, artists, journalists, speakers, mov-

ing picture actors and producers and people of public spirit, most of them giving their services, who were working zealously among our own people, our war associates, our enemies and the neutral nations.

The Committee was not concerned at all with censorship rules and regulations and constantly endeavored to secure, for the widest dissemination, all news of the war activities that would not benefit the enemy or obstruct our efficiency. As always in time of war, the decision upon what should be made public rested with the war making agencies of the Government. The function of the Committee was to secure important news and descriptions of all phases of our war making effort with as little waste as possible of the time and attention of absorbed and overburdened officials and to make systematic and effective distribution of all this matter at home, among our war associates, in neutral countries and even behind the enemy lines, and to combat enemy propaganda by meeting its lies and perversions with simple truth. It depended always and solely upon facts, whether material or spiritual, and did not in any phase of its work deal in opinions or arguments.

In each of the war making departments of the Government the Committee had a representative experienced in newspaper work under whom, in each of the department's bureaus, was an assistant whose duty was to know accurately all the phases and details of the bureau's work, to keep in touch with its progress and production, and to prepare such information concerning it as could be published. All this matter passed through the hands of the Committee's representative in the department, who was responsible for its accuracy. Connected with his office

was the censor for that particular war making agency who decided upon the military advisability of its publication. Of all the many thousands of releases for publication thus made the accuracy of only three or four was ever questioned, and of these one was afterward proved by official dispatches to have been true.

Practically all the reputable newspapers of the United States agreed with the Government to refrain from publishing any news obtained by their own representatives which would hamper the war making program or give information to the enemy and in every large newspaper office the country over hung the Committee's list of specified classes of information which they were requested not to mention. With one or two disloyal exceptions all the newspapers of the country voluntarily put themselves under this restraint and themselves censored their own columns until the end of the war. In no other country at war was the press ever so little hampered by governmental restrictions, or put upon its honor in this way, or animated by a spirit so unselfishly patriotic.

A Service Bureau of the Committee at a centrally located office in Washington provided information as to the officials, the function and the location of all Government departments and similar matters. In the rapid expansion of all these departments, the creation of new agencies and the overcrowded condition of the capital, due to the thousands of men and women pouring into and going through the city, it saved for all these people many hours and much energy. The inquiries that came to it by personal

appeal, by telephone, and by mail mounted to an average of many hundreds daily.

In addition to the news matter which it distributed at home and abroad, the Committee on Public Information sent out an official bulletin which, with a circulation of more than 100,000, gave information concerning all governmental affairs and activities in connection with the war; prepared special articles concerning all phases of the war progress of the nation which were widely published in the Saturday and Sunday magazine sections of newspapers; and published several series of pamphlets, written by authorities upon the questions discussed, which set forth the reasons for our participation in the war, exposed the pretensions of Germany and dealt with other important matters. These pamphlets also had a wide circulation and were especially useful for the hundreds of public speakers who talked to assemblages of people in mines, factories, ship-yards, theaters and other public places. They were intended to give information to all who wanted it and to furnish ammunition for the determined battle the Committee was waging to win the attention and rouse the feeling of a polyglot nation, huge numbers of whose people had not hitherto acquired much knowledge of or developed much interest in their adopted country.

For all this work several hundreds of authors, newspaper and magazine writers, publicists, university professors and others either gave their time and labor freely or took for their services an amount of pay that barely paid their living expenses, and, for the rest, were repaid by the satisfaction of doing something to aid the needs of their country.

An organization of speakers called "Four-Minute Men," working under the Committee, had a membership of 35,000 and gave short, incisive talks in five or six thousand communities, speaking at motion picture theaters, at factories during the noon hour, at country churches and school houses, at assemblages of every sort. The campaigns in which they took part embraced work for the Red Cross, the welfare organizations, Liberty loans, savings stamps, against German propaganda, and every kind of activity for the winning of the war that the nation engaged in. A bulletin for the use of the Four-Minute Men was prepared by the Committee's experts for each campaign, giving material for their suggestion and guidance.

In addition to these men, the Committee organized a great national campaign of public speaking which enlisted the services of patriotic men and women in each state, of returning soldiers, of people who had been abroad and had witnessed the fighting or had seen conditions in the belligerent and neutral countries, and of Allied officers. This work was decentralized and, by means of the coöperation of the State Section of the Council of National Defense, was organized in each state. War conferences and war exhibits were held in important centers, the war agencies in each state were brought into unison with the work and the campaign for informing and inspiring the people was carried through all parts of the state, down to the villages and country districts. A band of a hundred veteran French soldiers,—the famous "Blue Devils"—a Belgian regiment, and a company of American doughboys sent back from the front for this purpose were severally conducted at

various times across the country by the Committee on Public Information, with the double aim of helping the American people to realize the war more vividly and of enabling these fighting men to carry back to the front first hand information about what America was doing and what was her spirit.

At the request of the Committee the heads of the various advertising clubs of the country came together and mobilized for the country's service their organizations and their experts in every phase of advertising. For every one of the great campaigns for the prosecution of the war, these experts, under the direction of the Committee on Public Information, saw to the preparing of posters, advertisements, matter for bill boards, street car cards and all such matter. In the campaign to recruit 250,000 laborers for the shipyards, as a single instance, eighty advertisements were prepared by typographical advertising experts and were carried in magazines and trade papers that donated the space and gave a combined circulation of 8,000,000. In a similar way the Committee organized and utilized the pictorial assistance that could be given by artists. Its Division of Pictorial Publicity included nearly all the best known artists of the United States and to it went every department of the Government that wished to make pictorial appeal to the people. Its hundreds of members contributed, for all purposes, three thousand or more posters, cartoons and drawings and aided much in the inspiring and uniting of sentiment.

Photographs and motion pictures were important factors of the Committee's work. Through it were distributed all of the photographs taken by permis-

sion of the Army and the Navy and thousands upon thousands of these pictures, covering every phase of the operations of the war making and war production divisions of the Government, were published in newspapers and magazines, collected by individuals, used for the illustration of lectures and, in connection with some of the actual war making objects and with models of others, shown in exhibits at county and State fairs attended by millions of people. The motion picture division of the Committee's many-sided activities gave powerful aid in its campaign of education and interpretation both at home and in other countries. Important phases of the preparation at home for war and of the army in training or in battle in France were put into single reel and longer features, some of them providing a full evening's entertainment, and exhibited in thousands of moving picture houses in the United States and, with their captions translated into many languages, were sent all through Latin America, the Orient, Africa, the Allied and neutral nations of Europe, to carry their message of America's spirit and America's purposes.

All of these agencies the Committee on Public Information organized and used for the purpose of widening the horizon and informing and illumining the mind and spirit of our own citizens with regard to the causes, the purposes and the meaning of the war and of America's participation in it and to combat the specious and wide-spread propaganda of the German Government. That propaganda sought to blind our people to the issues involved, to create sentiment against our war associates, to undermine our faith in our own war agencies and our convic-

tion of the righteousness of the war and the adequacy of our war effort, and was especially insidious and dangerous among the ignorant, among aliens not yet well informed concerning the country and in some of the districts of the South. Wherever it worked the Committee met and endeavored to nullify its efforts.

Equally well organized, determined and successful, but much more difficult, was the struggle the Committee carried on against anti-American propaganda and influences in other countries. It had different phases and features, according to the conditions in the different lands, and it presents, altogether, one of the most dramatic and thrilling of all the stories of civilian effort for the war. But it is possible here only to outline its general features. The United States had for many years been soaked through and through with German propaganda, but so insidiously, so gently and so gradually had the work been carried on that scarcely any one had recognized its extent, its influence and its purpose. The shock of war brought some realization of what had been going on, the efforts of the Committee on Public Information revealed much more, and then the quick reaction of an intensely patriotic people brought against the pro-German campaign, paid for and directed in Germany, such a storm of popular indignation that it had little chance to make headway except among the ignorant and some of the foreign born. But in the neutral countries German propaganda, German effort to win sympathy and belief and set feeling and conviction against America and the Allies was in full possession and had to be combated with care and tact as well as haste and

energy. In every one of them America had been misrepresented, jeered at, lied about, pictured in colors that made her and her people the most despicable and loathsome upon the face of the earth, while her war effort was described as so inefficient and so impossible of success as to be ridiculous.

The Committee established an office in the capital of each one of the neutral countries, as it did also in that of each of our co-belligerents. The office head and the greater part of his staff went from home, but at his destination he secured translators and other helpers and had the hearty coöperation of Americans already there. His mission, carried on by every available means, was to oppose German propaganda and spread the truth about America. Publication was procured for news by wireless and cable and for descriptive articles by mail, while pamphlets and leaflets were widely distributed. Particularly well organized and efficient was the machinery for the sending of news by wireless and cable which carried to all the nations of the earth, except Germany and her allies, two thousand words every day about what America was purposing and accomplishing for the war. Until this machinery was started the neutral nations knew next to nothing of what this country was doing except through the perversions and outright lies of German agents. It was by this means that President Wilson's addresses and messages had almost world-wide distribution as soon as they were published in the home country and the advantage was gained of the striking influence they everywhere exerted.

Next to the news service in importance was the influence exercised by the moving picture films,

which everywhere won favor almost instantly, aroused the greatest interest, by their better quality crowded out the German films and in every country brought straight to the people such knowledge of Americans, of their every day life, of their purpose in the war and of their wonderful achievements for its prosecution as amazed them and greatly helped to turn the general sentiment as much in favor of as it had previously been against the United States. These pictures, on the civilian side, were gathered from every phase of American life, showing our cities, our agriculture, our educational institutions, our industries, our homes, our manifold efforts for social welfare, and were used to correct the deplorably mistaken conceptions about this country which had gained vogue almost all over the world. They were always followed by pictures of war work, such as training camp activities, aviation fields, ship building and other matters, with films also of our camps and troops in France.

A Foreign Press Bureau had the services of a long list of authors and publicists, many of them of wide reputation in our own and other countries. It sent every week to each one of the foreign representatives of the Committee a budget of matter that supplemented the daily news service and covered every phase of American life and endeavor. From the different countries came requests by cable for articles on specific subjects of the greatest variety which were prepared by specialists. One of these articles was reprinted by the British Government for use in England, where it distributed 800,000 copies. Through this Bureau and in connection with the matter it issued went posters, captioned in the lan-

guage of each country to which they were sent, and millions of picture postals and photographs. The Committee representatives in the various lands commandeered the show windows of American business houses and kept up in them a frequently changed display of posters, bulletins and pictures.

In some countries reading rooms were established equipped with American newspapers, magazines and books and decorated with American posters and photographs, and in some cases classes were held in them for the study of English. Sometimes men of American citizenship and of thorough patriotism were sent back to their native countries to talk to and with the people concerning America. A company of newspaper editors from each of several countries toured the United States as guests of the Committee on Public Information and others from Spain, Switzerland, Holland and the Scandinavian countries were taken through the districts of American war works and camps in France. What they saw was so different from their preconceived and Germany-perverted ideas and made such a revolution in their minds that it changed the tone of their papers and had a notable influence upon public opinion in their respective countries.

German propaganda was busy against America even in the countries of our war associates where it sought to undermine confidence in us, create suspicion of our purposes and in each one instill the fear that the United States would join some other of the Allies against that particular one. This presented a problem easier to deal with than did the neutral countries because the Committee had the coöperation of the respective governments. The same means were

used as in the neutral countries, the moving picture being a particularly efficient instrument in the work. Russia was the only country in which the Committee failed to win its purpose. Its representatives there worked hard and zealously, but Russia was so big and inarticulate, the German propaganda had behind it such vast sums of money and the Bolsheviki, as soon as they gained the upper hand, shut down so completely upon all freedom of expression except for their own ideas and purposes that they had finally to give up their struggle. But they had used the opportunity to spread information among the advancing German troops, to leave the seeds of some knowledge of America and her desires and aims, and they did achieve some worth-while results in Siberia and in the prison camps of Russia.

Some of the most interesting and valuable work done by the Committee in this war of ideas was in connection with its effort, in which it coöperated with the War Department, to inject some real knowledge of America into the enemy's troops and into the country behind his armies. The Committee prepared most of the material for this purpose, among those engaged upon the effort to make it efficient being authors, historians, journalists, and advertising and psychological specialists, while the military forces undertook the job of distribution. Immense quantities of material, pamphlets, leaflets, short, pungent statements, speeches, facts about America's war preparations and intentions, were dropped by the ton upon the troops of the Central Powers and behind the lines upon cities and towns and countrysides. They were carried by airplanes which spread the documents far and wide, they were thrown by

rifle grenades, by rockets and by a specially developed type of gun. Balloons of various kinds rained literature upon armies and the country just behind them. Kites dropped leaflets upon the trenches. An American invention was a specialized balloon with a metal container for the literature and a control attachment governing the movements of the balloon and the distribution of the ten thousand leaflets it carried.

There can be no doubt of the effectiveness of this campaign upon the minds of the enemy's people because, in the first place, both the German and the Austro-Hungarian governments went to the most extreme lengths in the effort to combat it, making death the penalty for touching the literature. Nevertheless, the majority of the prisoners captured by the Americans had it in their pockets. In the next place, the influence of it became evident after the war closed in the temper and attitude of the enemy peoples and their determination to discard crowns and thrones and set up democratic governments. President Wilson's speeches were found to be especially effective, each one that was sent across the lines being followed invariably by increasing ferment and dissatisfaction among the people. Into Germany, when the German censor had mutilated one of these speeches and distorted its meaning, the Committee at once sent the entire speech in German with the omitted and distorted parts properly printed in red. The result was so evident that the German government soon began to print the President's addresses correctly and in full.

It was a difficult fight that the Committee waged outside of the home country and the lands of our co-

belligerents, for it had to meet a tricky foe who already held possession and would and did use all manner of insidious means and lying statements. But everywhere the Committee presented its claims frankly and openly, telling the authorities just what it wanted to do and what its methods would be, offering to the people plain and true statements and depending upon their honesty, intelligence and sense of justice. One large factor in its success was undoubtedly this openness and honesty of purpose and methods. The completeness with which public opinion in the neutral countries finally swung to the side of the United States and the Allies, the collapse of civilian Germany and the decay of morale among the German and Austro-Hungarian troops all helped to prove the importance and the success of its long, hard struggle. Just how great a portion of these developments was due to the Committee's work can not yet be estimated. But, because mind and spirit dominate force and its weapons were wholly those of mind and spirit, it is already evident that it deserves no small measure of credit.

CHAPTER XXV

WAR-TIME CONTROL OF TRADE AND INDUSTRY

THE entire commercial and industrial life of the country was established on a war basis very soon after war was declared. Trade had to be thus mobilized in order to defeat the efforts of the enemy to supply himself by roundabout and underground means with American products and in order to use efficiently the organization of commerce for the prosecution of the war. Industry had to be mobilized in order to make sure that it would produce all the enormous amounts of every sort that would be needed for war purposes. A people accustomed throughout their history as a nation to a minimum of governmental control of or interference in their business affairs and believing in and practicing the principle of individualism in business suddenly found themselves called upon to surrender that principle and submit to pervasive governmental regulation. It was a sharp and searching test of patriotism and of loyalty to national ideals and it put to thorough trial the mental elasticity, alertness and resourcefulness of the business life of the country.

These new conditions, limitations and controls were administered by War Boards of Trade and Industry. That for trade was instituted six months after the declaration of war as a more comprehensive and effi-

cient successor of an Export Administrative Board. The purpose of the War Trade Board was primarily to carry out the provisions of the Act forbidding Trade with the Enemy and certain portions of the Espionage Act. It had under its control the whole of the foreign commerce of the United States, which it managed by means of a system of licenses for exports and imports. Not a pound of goods of any sort could be shipped out of or into the country without a license granted by the War Trade Board, and no license was granted by it without full knowledge of the character of the shipment, its destination if an export and its source if it were inward bound. It had its branch offices in a score of cities, its representatives in foreign countries, its trade advisers and distributors who were men of intimate and extensive knowledge of trade conditions in all commodities at home and abroad, its members who supplied information concerning war trade matters all over the earth, from Iceland to Cape Horn and from Siam round the world to Japan, its bureaus which studied the problems constantly arising and collected data for their solution and for the guidance of the Board. The applications made to the War Trade Board for export licenses, nearly all of which were granted, averaged over 8,000 per day. The transactions which passed daily through its hands represented values of from $40,000,000 to $50,000,000. It had 3,000 employees, most of whom were located in its Washington offices, although its representatives were to be found in every important trading post in the world outside of enemy countries.

The War Trade Board, by limiting exports, conserved the products of the country for the use of our

own people and the people of the nations associated with us in the great conflict so that these products might be used in whatever way would best aid the prosecution of the war; it so controlled and supervised the shipping of goods to associated and neutral nations as to conserve shipping space for military uses; it regulated with the closest surveillance the shipping of goods to neutral countries in order to make sure that they would not be re-shipped in covert ways to enemy destinations; it hunted out enemy and enemy-controlled firms in our own and neutral lands, closed up the former and prevented trade with the latter, although it also in neutral countries made every effort to find and list for American merchants, in the place of these forbidden firms, others in the same lines not friendly with the enemy with whom trade could be carried on; and it so arranged trade with neutral nations as to supply them with necessities, under guarantees that these should not be reëxported, in return for their export to the United States and her associates of certain needed products and permission for this country to use their shipping.

This mobilization of the commercial arm of the United States soon proved its value and the government's control of trade through the War Trade Board was a highly important factor in hastening the winning of the war. The firm hand which was laid on commerce with certain neutral nations of Europe, through which Germany had been getting large amounts of food and supplies, finally made effective the blockade of the enemy. The trade of those nations with the United States during the two and a half years before our entrance into the war had jumped to enormous figures, many times its previous

volume. When the War Trade Board assumed control of American commerce it fell, in the case of one nation, to one-twentieth of what it had been in the first year of the war, while the total exports of food stuffs of the neutrals of northern Europe to the Central Powers declined in a few months by from sixty-five to eighty-five per cent of what they had been in the previous year.

The Board procured, by trade arrangements with European neutrals, the use of shipping for the United States and Great Britain amounting to over two million tons, for which there was the greatest need for transportation of troops, munitions, foods and supplies to Europe. For this same purpose the Board conserved much tonnage by practically suspending, for several months, trade in many commodities with South America and the Orient. Working in harmony with the War Industries Board, it prevented the shipment out of the United States of all materials needed by this country and the associated nations for the swift and efficient prosecution of the war.

Both the War Trade Board and the War Industries Board coöperated constantly with the other civilian organizations through which the nation carried on its support of the war, such as the Food Administration, the Fuel Administration, the Council of National Defense, the U. S. Shipping Board Emergency Fleet Corporation and the Railroad Administration, and by this union of organization kept up a harmonious, smoothly articulated and swiftly moving team-work through which the full resources and powers of the entire nation were mobilized and put to the service of the two direct war agencies of

the Government, the War and the Navy Departments.

The function of the War Industries Board in this nation-wide scheme of organization was so to organize and regulate the industries of the country as to insure the materials necessary for the war prosecuting agencies of the Government and at the same time protect the country's civilian needs. It was charged with providing the nations associated with us in the war with such military supplies as they desired and America could spare and neutral nations with such commodities as they needed and would exchange for materials essential to this country. Thus these two administrative war agencies, the War Trade Board and the War Industries Board, together had practically complete control of all the vast affairs of the whole nation's industry and commerce. As a sculptor works a piece of clay into any desired form, these two boards took the country's business life into their hands and moulded and shaped it into a war-making machine.

By a system of priorities that governed both production and distribution the War Industries Board regulated the supply of raw materials to manufacturers and the delivery of finished products. It stimulated production and speeded distribution of whatever was urgently needed for the fighting forces, for exchange with neutrals or for our own people, but limited the supply of raw materials, or coal, or electricity, or labor, and temporarily withheld the facilities of distribution when need was not immediate, or when there would otherwise have been interference with some war-making effort. Every important class of industry in the country, and some that were not of

large consequence in so far as the size of their business was concerned, came within the scope of the Board's operations. The expert leaders of these industries were represented among the advisers of the Board, to which they brought their comprehensive and profound knowledge of resources, conditions, methods of operation, and quantity, quality and ordinary destination of output. Industries were listed, classified and studied to determine the degree of preference to which each was entitled, and in many cases the same method was applied to individual plants within an industry. To those entitled to preferential treatment because they could best subserve some phase of war need was given priority of service in all their requirements, while the needs of others were deferred until the preferred industries or plants were satisfied.

It is not possible to describe all the multiple achievements of the War Industries Board, but a glance at them shows many of vital importance. By establishing maximum prices upon a number of staple raw materials necessary in the war-making program, an executive order of the President putting into legal operation its agreements and decisions, the Price Fixing Committee of the Board stabilized prices and prevented or lessened profiteering in many industries. The Conservation Section reduced wastage in industry in various ways, but especially by curtailing the number of patterns, or varieties, in each of many lines of production, scrutinizing for this purpose nearly two hundred different industries. Thus, the thousand and more different patterns for a buggy step were reduced to two, with resulting economy of both labor and material. A Committee on Emerg-

ency Construction took charge, under the Construction Division of the Government, of the vast building program upon which the nation had at once to enter. Cantonments, flying fields, camps, hospitals, embarkation depots, docks, wharves, storehouses, ordnance, powder, explosives and nitrate plants and other structures had to be built with the greatest possible rapidity. The War Industries Board first developed a method for getting the necessary information concerning contractors who could take charge of this enormous building program and devised a scheme of organization and then, by means of its priorities system, made sure that each operation should have at the moment of need the necessary materials, transportation facilities and labor. These structures, finished and in construction, totaled a cost at the end of the war of approximately two billion dollars. The Chemical Division did highly important work in the way of instituting, aiding and speeding scientific investigations and stimulating new chemical industries, such as the potash supply and the dye industry. The Steel Division received the enthusiastic coöperation of the steel manufacturers, who speeded up their plants for the production of the immensely increased quantities needed of this vital product. More and more steel, and ever more steel, was necessary for the making of munitions, guns, cannon, rails, locomotives, shipyards, ships. In the last six months of 1918 the steel products that went into direct and indirect war necessities amounted to 22,000,000 tons, a production of about twenty-five per cent more than would have been the reasonable expectation for the period. The Steel Division handled approximately 40,000,000 tons of steel per year. The

Board's program of speeding work greatly increased the output in many vital industries. For instance, the locomotive industry doubled its production in three months without increasing its facilities or expanding its works. It has been estimated that the industrial capacity of the country was increased by at least twenty per cent.

All over the country business men coöperated with the War Industries Board with patriotic zeal, willingly curtailing their output and reducing their incomes in order to release material, capital, labor, fuel, transportation facilities, for the expediting of work necessary for the winning of the war. Dozens of them left their affairs in the hands of subordinates or gave up high-salaried positions and entered the service of the War Industries Board in order that the nation might have the advantage of their training and their wide and expert knowledge. These men, who were generally known as "the Government's dollar-a-year men," because legally the Government can accept no gratuitous service, freely gave to the country, as their contribution to the winning of the war, what it could not have bought for millions of dollars and worked with as much energy and ardor as ever they had done for the making and furthering of their own fortunes.

CHAPTER XXVI

"THE GREATEST MOTHER IN THE WORLD"

BEFORE the world war the American Red Cross would have had ample reason to complain, had it been so minded, of the indifference of the great masses of the American people to its rightful claim upon their interest, sympathy and support. But its world-wide works of compassion during the war, that won for it the loving titles of "The Greatest Mother in the World" and "The Universal Mother," opened their eyes and their hearts until they almost merged themselves in it and made it the organization through which they themselves functioned for the help of the war-made need and suffering.

The American Red Cross was transformed to a war basis within a month after the United States entered the conflict. It had then less than half a million members. Five months later they numbered five millions. The membership rose to fifteen millions in the following spring and a campaign for new members in December, 1918, for which arrangements had been made before the end of the war, raised the number to nearly 18,000,000, an average of membership in the Red Cross for almost every family in the Union. In addition, the Junior Red Cross, composed of school children organized under their teachers into

auxiliaries for Red Cross work suitable to their ages, numbered approximately 10,000,000.

Whatever the Red Cross has asked of the American people for the financing of its vast works of mercy they have given with overflowing hands. In June, 1917, it went to them for a war fund of $100,000,000. They gave it $115,000,000. In May of the following year the Red Cross told them it needed another hundred million dollars and they gave it $176,000,000. Altogether, more than 47,000,000 American people gave to the Red Cross during our war period $325,000,000 in money and manufactured products of a value of $60,000,000.

Of the 8,500 persons who carried on the administrative and executive work of the organization in its national, divisional and foreign headquarters 2,000 were volunteers. Many of these unpaid executives gave up large salaries and important positions in private life to devote their skilled and capable service to this world mother. Of the paid employees more than 5,000 received no more, and some of them less, than $1,500 a year.

Almost 4,000 chapters, with 16,000 branches, covered the entire country with a network of busy groups whose willing hands contributed aid and comfort that the Red Cross carried widely over land and sea. A division in which were organized Americans outside of the continental limits, called the Insular and Foreign Division, girdled the earth and included a membership of 100,000 adults and 125,000 juniors. Its members contributed almost $2,000,000 in money and finished products representing a value of $1,500,000. They were scattered throughout Central and South America, the West Indies, Hawaii, the Philip-

pines, little Guam, China, Japan, Siberia, Spain, Portugal, Sweden and Switzerland.

In nearly 4,000 Red Cross chapters more than 8,000,000 women gave volunteer service so faithfully that, however untrained they were at the beginning of the war, at its end the big majority of them were skilled workers in all the Red Cross needs. They made a total of 291,000,000 articles, in which were used raw materials costing $40,000,000. All of these articles were standardized, army surgeons establishing the standard for surgical dressings and a committee of women, sent to Europe for that purpose, designing models and illustrations of garments needed in the hospitals and in civilian relief work. Knitted garments and comfort kits were also made by uniform models. Practically every American fighting man who went overseas during the last year of the war and every man in the training camps who needed them were supplied with Red Cross knitted articles, while many of the Allied soldiers and thousands of refugees wore them with gratitude. These volunteer Red Cross workers, who at the same time were busy upon their home duties, made over 250,000,000 surgical dressings, 14,000,000 knitted articles, 1,400,000 garments for refugees and 22,255,000 garments and supplies for hospitals. They also renovated hundreds of thousands of soldiers' garments and aided in the collection of thousands of tons of clothing for the destitute in Europe.

Through the Home Service section of the Red Cross organization communities all over the country, alike in cities and remote country districts, found the opportunity of giving individual service which would help in the winning of the war by sustaining

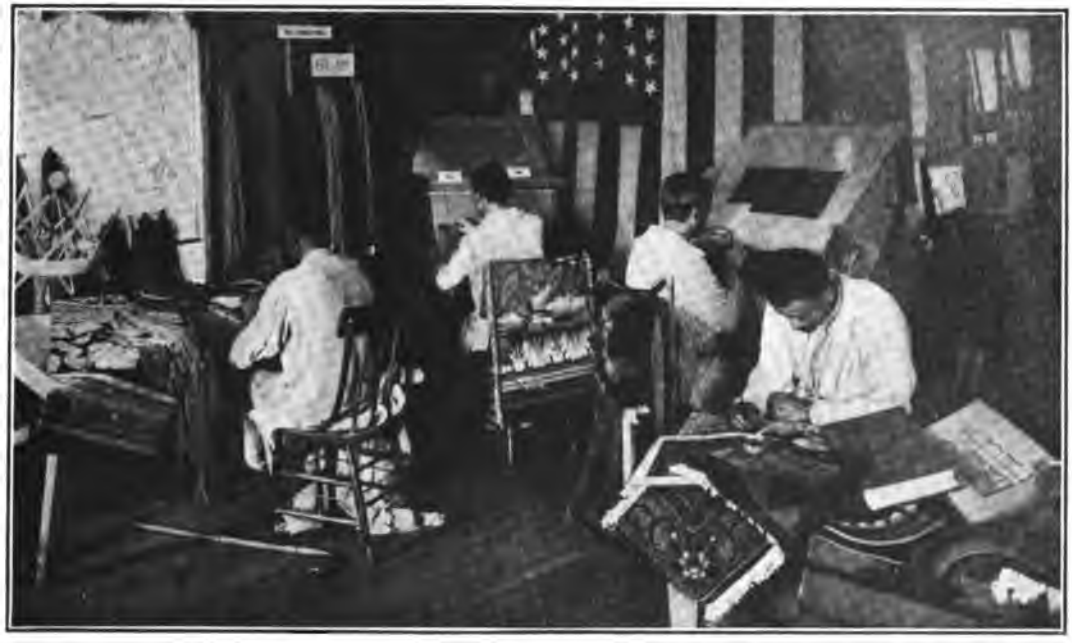
the morale of soldiers' families and promoting the public welfare. Through this branch of Red Cross activity, in which 10,000 local committees and 50,000 men and women participated, 300,000 families of soldiers were aided with advice, counsel and practical helpfulness of whatever sort was needed for the solving of business or legal tangles, household perplexities, family problems, difficulties due to illness, worry and loneliness. These Home Service workers carried on a nation-wide campaign to encourage the writing of cheerful letters to the men overseas, they spread a doctrine of neighborliness toward soldiers' families, they enlisted the aid of physicians, lawyers, business men, teachers and others who could give the special kinds of assistance that were needed and they devoted to this work of conserving morale and promoting welfare some $6,000,000, aside from their personal service, which was far beyond money value. Training courses were instituted to fit for more intelligent and efficient work those wishing to enter this branch and were taken by several thousand persons.

The Red Cross carried on a camp service at all the camps and cantonments in the United States which rendered emergency aid, looked after the welfare of sick soldiers and maintained connection with the Home Service section. It established soon after we entered the war at more than five hundred railway stations a canteen service which furnished refreshments to traveling soldiers and sailors, while its sanitary service coöperated with the public health authorities to maintain healthful conditions in military zones. It coöperated with the Government by organizing base hospitals, naval hospital units, and ambulance companies and by enrolling nurses, of whom

over 30,000 answered its call, and forming them into units for service.

Overseas, the army service of the American Red Cross was to be found wherever it could aid in caring for the wounded of the front line forces or in safeguarding the health and improving the comfort of soldiers in the rear of the battle zones. It built huge storehouses for the temporary housing of its supplies at every American port in France, at distributing points, at army concentration camps and behind the lines. It erected two nitrous oxide plants that together produced 25,000 gallons per day. Its canteens and rest rooms were strung along the lines of communication between front and rear, its rolling canteens and hot drink kitchens carried comforts and refreshments even into the front line trenches, it helped to maintain sanitary conditions wherever there were American troops, it cared for the sick and the wounded in base hospitals and convalescent homes, it looked out for American soldiers in enemy prisons, learned their addresses and furnished them with food, clothing and supplies, it searched for the missing, gave counsel to the troubled, and was ready with instant help for any and every need of the soldier or sailor.

While its first interest and care were for the men of the American Expeditionary Forces, its similar services were always ready for the needs of the soldiers of the Allied nations. To the French soldiers the American Red Cross gave especial attention because, on account of the long and desperate struggle which France had carried on with the enemy on her own soil, their need was greatest. The advance guard of the American Red Cross on its war footing which



WOUNDED MEN IN A HOSPITAL WEAVING RUGS

went to France in June, 1917, numbered nineteen men. Within six months it had there 3,000 workers, whose numbers were constantly being augmented, it was providing food, baths and beds to 20,000 French soldiers per day at its canteens and rest rooms on the lines of communication, serving hot and cold drinks from canteens at the front, while at its metropolitan canteens an average of 750,000 French and Allied soldiers were being fed each month and it was giving invaluable aid and service to French hospitals.

Among the populations of the countries that were fighting the common foe the work of the American Red Cross was of incalculable value in the saving of life, the prevention of suffering and the conserving of morale. Its civilian service was wide spread and included the people of Palestine, Roumania, Greece, Serbia, Poland, Russia and Siberia, Italy, Switzerland, Belgium, and France. The service it gave varied with the local needs. In Switzerland it dealt mainly with the interned, the refugees and the prisoners that were being returned to their own countries, providing food, clothing, comforts and whatever assistance was needed. In Italy, where at the end of the war the Red Cross had expended almost $17,000,000, its appearance in the summer of 1917, the advance courier of American's assistance, was of great value in counteracting German propaganda against the United States and proving to the people that they could depend upon American aid. It fed thousands of the refugees from the invaded region; its canteens, rest-houses and distributed comforts cheered the Italian armies at the front and their supporting lines; it furnished hospital supplies and scores of ambulances manned by Red Cross drivers;

it sought out the families of soldiers that needed aid and gave help to more than 400,000; it established work rooms for women, nurseries and schools for children, homes and colonies in the mountains and at the seaside for children who were ill; and at the end of the war it had under way a campaign against tuberculosis.

In Belgium it carried on a children's service by aiding existing hospitals, building new ones, establishing colonies and nurseries for children and organizing the aid of nurses and physicians for baby-saving effort, gave to all in need dispensary and home service and food, and supplied its usual army service for the Belgian soldiers whether at the front, in hospitals or interned in Holland, and gave, in addition, educational help. Among the half million and more Belgian refugees it set up administrative relief units of its own which coöperated with those of Belgium and aided with money, machinery, food, clothing, materials and friendly help of every sort.

In England the Red Cross service was devoted to caring for the hundreds of thousands of American soldiers and sailors passing through on their way to and from the front, or in camps, nursing the wounded sent back from France, and providing for those shipwrecked near British shores.

In France, in addition to its very great and important work among the soldiers of our own and the Allied armies, with its many hospitals and convalescent homes, its diet kitchens and hospital huts, its medical supplies, its baths and sterilizing plants, its canteens and kitchen service, and its expert service in searching for missing men, it carried on extensive civilian relief in coöperation with the French

Government and with French societies. It cared for refugees, for needy families whose men were at the front, provided clothing, food, medical attention and better housing, helped to rehabilitate battle devastated regions and enable their population to return, inaugurated an anti-tuberculosis campaign and carried on a children's service for the saving of babies' lives and the conserving of the health and welfare of children. The American Red Cross had 9,000 persons in all the activities of its service in France during our war period.

Long before the end of the war the Red Cross began to turn its attention to the great problem of the reëducation of blind and maimed soldiers. It gave them training in the use of artificial limbs so that they could use these substitutes deftly and offered vocational training that would fit them to support themselves and their families in new occupations in which their mutilations would not be a handicap. In France it worked in coöperation with the French Government, carrying on by means of moving pictures and lectures an extensive educational propaganda among the wounded in the hospitals to enlist their interest, stimulate their courage and persuade them to undertake the training, giving assistance to existing schools, establishing an electrical training work shop and a large and well equipped farm for agricultural training in modern scientific methods. In the United States it turned the activities of the Red Cross Institute for Crippled and Disabled Men to war service and carried on schools for the training of those who wished to aid in the treatment by vocational therapy of wounded convalescents.

CHAPTER XXVII

FEEDING THE NATIONS

IN April, 1917, the long and bitter struggle had so drained the food supply of the Western Allies that they were dependent upon North America for the food that would enable their armies to continue the battle for civilization, prevent the starvation of their civilians and the wholesale death of their children. To this country the neutrals of Europe had also to look for sufficient food to save their people from suffering. There was much grain in Argentina and Australia, but ships could not be spared for the long and dangerous journeys to and from those countries. Submarine warfare had destroyed so much of the shipping, not only of the Allies but of the European neutrals as well, that every available ship was needed for use on the Northern Atlantic. Therefore, North America was the last reservoir of food, the last producer of food, to which the hungry populations of Western Europe could turn for the sustenance of their armies and civilians or the neutral nations and such of the subjugated peoples under the German yoke as could be reached look with hope for any help. All Europe was on the verge of starvation and only North America, which meant chiefly the United States, could give assistance. For this country to produce and conserve vast quantities of food

and send them to Europe had become one of the fundamental necessities for the winning of the war.

The United States Food Administration was created, under the Food Control Act passed by Congress in August, 1917, for the purpose of handling this situation in such a way as would give the nations with which we were associated the food they needed and would at the same time protect our own people against food scarcity and excessive prices. A Food Administrator, acting under the informal request of the President, had already been at work for three months, securing data and working out tentative plans, and had opened the way and accomplished much by appealing to the people for voluntary coöperation. The work of the Food Administration throughout the war was another example of the splendid team-work of the whole nation and of the highly efficient coöperation of all the agencies of the Government. In coöperation with it the Department of Agriculture bent its energies to the stimulation of food production, the War Trade Board controlled food movements between this and other countries, the War Industries Board saw to it that such manufacturers as produced goods needed in the production, storage, conservation and movement of food supplies received the necessary raw material. Leaders in the grain trade, familiar with all its phases, gave up their connection with enterprises of profit and at great personal sacrifice volunteered their services to act as managers of the corporation through which the Food Administration purchased its immense grain supplies and controlled the grain situation. Dealers in food stuffs of every sort, both wholesale and retail, willingly deprived themselves of

large possible profits and obeyed the requests of the Food Administration. And the people all over the country voluntarily pledged themselves to the necessary program of food conservation. The task of feeding the nations of Europe and the armies of America, England, France and Italy became the task of the whole nation, and the whole nation, guided by and functioning through the Food Administration, took up the task with eager hands.

We entered the war with our national stocks of cereals at a lower level than they had been for many years, due to the heavy demand made upon them by the Allied nations during the previous year. There had been also, for the same reason, a considerable lessening in the number of food animals.

Beginning in the spring of 1917 and continuing through that and the following year the stimulation of production was carried on by setting before the farmers of the country and, indeed, before all the population, the urgent need for more food than the nation had ever before produced. The appeals to grow food went to the owners of back-yard gardens in cities and towns and villages, to all who had or could obtain the use of a few square feet or a few acres of soil, to farmers all over the land. The Agricultural Department used all its avenues of reaching the farming population, agricultural colleges aided the movement, newspapers and magazines published discussions of the subject and advice for the amateur. It has been estimated that during the first year of the war at least 2,000,000 "war gardens" were planted, over and above the usual garden planting, and that number was considerably increased during the second season. Most of them bore good results

and their products added immensely to local food supplies and so lessened the drain upon exportable foods. The "war garden army" included men, women and children. Business men spent leisure hours hoeing and planting, thousands of women, in addition to those who worked in home gardens, turned their attention to agricultural labor and did what they could in the lessening of the serious problem of help on the farms. Boy Scouts and Girl Scouts did efficient work, school boys who were old enough and strong enough to make their labor right and worth while went by the thousands from cities and towns to country districts to work upon farms.

Guaranteed prices for wheat, established in accordance with the conclusions of the Food Administration and its committee of expert advisers, prevented the sky-rocketing of prices and assured the farmer a staple return for his labor. This, in addition to what the farmers already knew of the need for food, resulted in the planting of immense acreages. In 1917 there were planted 35,000,000 acres of leading crops beyond the average of the five-year period immediately preceding the war, and 22,000,000 acres in excess of the previous year. But 1918 exceeded even this vast acreage with a planting of 289,000,000 acres, an increase over the preceding record of 5,600,000 acres. The bitter winter of 1917-1918 killed much wheat and the next summer drouth withered much corn. Nevertheless, the aggregate yield of the leading cereals in each of these years exceeded that of any preceding year in the nation's history except that of 1915, when unusually favorable weather produced a more bountiful harvest from a smaller acreage. With the expectation that the war would

continue until at least well into the next summer, the Government appealed in 1918 for a still greater production of wheat for the following year. The farmers responded with a planting of winter wheat amounting to over 49,000,000 acres, which, it was calculated, with average winter weather and an average crop of spring wheat, would insure for 1919 a wheat production of over a billion bushels, an excess over that of 1918 of probably 200,000,000 bushels.

All the principal kinds of live stock—horses and mules, in spite of the big exportation to Europe for army needs; milk cows, other cattle, hogs, and even sheep for the first time in many years—were increased in number by from one to twelve millions. Meat, milk and wool production showed signal increase, that of beef of a million pounds and of pork twice that amount.

The zeal of the whole country for increased food production appeared not only in the multiplied thousands of war gardens, the desire of every one who had access even to a few feet of soil to make something eatable grow upon it, and the immensely increased acreage devoted to the sorely needed cereal crops, but also in a striking growth of interest in agricultural matters of all sorts, whether of farm or garden. To all such subjects newspapers and magazines began devoting much more than usual attention, while for books dealing with them publishers noted a sharply increased demand.

The Food Administration was so organized as to decentralize its operations as much as possible and bring them into direct touch with the people. Under the United States Food Administrator, and also appointed by the President, was a food administrator

for each state who selected one for each county in his state. These county administrators in turn appointed special committees or committee chairmen to keep track of and solve local food problems and to keep each locality in touch with the aims and operations of the national organization. Upon these local committees were representatives of local grain and food trades, of hotels and restaurants, of clubs and associations of various kinds and directors of educational work. Through these assistants educational campaigns were aided and directed, close watch was kept to prevent both hoarding and profiteering and a nation-wide survey of the food situation was in constant progress. It was all voluntary service, from that of the United States Food Administrator down to the county chairmen and the local committees, given with enthusiasm and the best ability each could bring to the service, with the single-hearted hope of helping the nation to win the war.

The primary purpose of the Food Administration was to make sure that there should be sufficient food to meet the needs of our fighting men on land and sea both at home and abroad, to provide such a supply for our people at home as would maintain them in health and comfort, and to furnish to the nations associated with us for their armies and civilians as much of our surplus as they might need. To make that surplus as large as possible called forth its most strenuous endeavor. In addition, it aimed to maintain an even supply of the essential foods and to stabilize prices by preventing, as far as possible, hoarding, speculation and profiteering.

The problem of food for the Entente warring nations was reduced in the spring of 1917 to the de-

termination of the amount of food that could be drawn from North America, of which, of course, the chief portion would come from the United States. The surplus over our normal consumption, in all classes of food, which we usually exported, had always been small and would have to be multiplied many times over in order to meet pressing needs, in order, even, to win the war. Moreover, we had diverted from eight to ten million men from their usual productive activities and set them to the making of war and supplies for war.

The situation could be met only by a nation-wide program of conservation which would save vast quantities of the sorely needed food out of the usual prodigal consumption and waste of our own people. With complete confidence that the American people would respond of their own good will the conservation measures were all made voluntary. People were asked to eat more carefully, to waste nothing, to use less wheat, meats, fats and sugar, to combine flour from other grains with wheat flour and especially to use more corn. Grocers were directed to see that their customers purchased pound for pound of these other materials and wheat flour. The nation was requested to reduce its sugar consumption by fifteen per cent and housewives and other buyers of food were told that it was necessary to limit their purchases of sugar to three pounds per month for each individual. Homes and hotels and restaurants were counseled to institute wheatless and meatless days. Appeal was made to all who had charge of the providing of food for others and to every individual consumer to waste no food of any sort.

Pledges sent out by the Food Administration which

bound every signer to observe its requests and rules were distributed by many thousands of volunteer workers, men, women and children, who saw in the work of securing signatures opportunity for patriotic service. Pamphlets and leaflets setting forth the reasons for what was asked, giving expert advice on the use of foods, analyzing the food situation, and urging compliance with the requests of the Food Administration were sent all over the country. Posters contributed by well known artists were hung on hoardings, in windows, and on home and office walls in cities, towns, villages. There was hardly a newspaper or a magazine of any sort in the whole United States but freely gave space to the always cogent and interesting articles furnished in great quantity by the Food Administration in support of the purposes it had set itself to achieve. Speakers who could present in living words the urgent need of food and the crucial test laid upon the country of producing and saving immense quantities of meat, fats, wheat and sugar addressed general and special audiences in many cities. Experts in home economics gave lectures and demonstrations and conducted classes that were attended by thousands of women, rich and poor alike. Especial effort was made to furnish this sort of education to the women of poor and ignorant families in order that they might learn how to provide food that would give equal nourishment at less expense.

Colleges and schools aligned their vast educational equipment with the food production and conservation movement and gave important service. When the colleges and universities for women or admitting women were asked, at the end of 1917, if they would

undertake to give special instruction looking toward the aiding of the Food Administration's purposes seven hundred of them, practically every such institution in the country, replied within a week asking to be supplied at once with the necessary material. Courses were outlined and supplied, prepared by experts upon the subjects, which dealt with the world food situation and the part the United States should take in it, with food values and the principles of nutrition. During the winter and spring of 1918 40,000 young women took these courses, which were repeated at summer schools in nearly all the colleges of the nation and were offered again in the autumn. They were also opened to men students, who saw in them a means of patriotic service. Under a secretary for each state appointed by the Food Administration, the graduates of these classes were organized and their services directed by the State Food Administrator. They gave to local administrators and committees efficient service of varied sort, depending upon the locality and the need of the moment.

So successful was the initial work of the collegiate section of the Food Administration that its activities were soon enlarged to include the schools also and several text-books were prepared for use in both high and lower grades that would show to the pupils the relation of food to the war and the part they might play in the winning of the conflict and would inculcate the ideal of service. The National Educational Association asked especially for such a textbook to be used by children below the high school grade and by means of an advisory committee cooperated with the Food Administration in its educational program in the schools. So important and en-

thusiastic was the work of the schools and colleges that a state director of their activities was appointed in each state to correlate their efforts with the other undertakings of the state food administrator and so make team-work for the production and conservation of food more thorough and efficient.

The central offices of the Food Administration in Washington expanded amazingly as the country leaped to its support and asked for instruction, advice and guidance. It began, a month or more after our entrance into the war, in two rooms, with a Food Administrator, whose office was informal and tentative until Congress in August authorized the program of food control, and two or three assistants. By the first of January it filled a huge structure holding over a thousand employees and in the following summer it crowded both this and another building of equal size. It finally had in its service nearly 8,000 employees and under its coördinating hand were the purchase and control of food-stuffs whose value amounted to $300,000,000 per month. To its staff came men and women of expert knowledge from all over the country, many of them giving voluntary service,—university professors who were specialists in food and other economic subjects, journalists, magazine editors, office experts, scientists whose specialties would throw light upon one or another phase of the food problem.

The Food Administration dealt with prices in the food trades, which were prevented from sky-rocketing above the levels caused by war conditions, and with speculation and profiteering by means of a system of licenses applying to all persons engaged in the importation, manufacture, storage and distribution of

certain staple foods and including retailers doing more than $100,000 yearly business. The purpose of the system was to stabilize prices by limiting those charged to a reasonable amount over expense, by preventing the storing of food in large quantities in the hope of speculative profits on a rising market, by keeping all food commodities moving from producer to consumer with as little delay from unnecessary business transactions as possible and by limiting as far as practicable dealings in contracts for future delivery. Every licensee was required to make reports of his dealings once a month and none was allowed to keep on hand or under control food-commodity supplies for more than a certain term in advance, set, with some exceptions, at sixty days. Retailers doing less than $100,000 business annually were exempt from the licensing system but were forbidden by the Food Control Act to hoard or waste food or to charge excessive prices. In the neighborhood of 100,000 licenses were taken out and of all these only an insignificant percentage were ever found guilty of breaking the provisions of the law. Equally rare were attempts to break or evade the law by retail dealers. Nearly all of even these small numbers were brought back to right feeling and right action merely by confronting the violater with proof of his wrong doing. As punishment, if punishment was necessary, his license was revoked or suspended, or there was forced sale of his hoardings, or his place of business was closed for a period, or he was required to refund excess profits or to make a contribution to some patriotic organization. But the whole hearted desire to aid and coöperate with the Food Administration in its efforts to solve the food problem and

meet the food necessities of the time was so nearly universal that the few exceptions were noteworthy chiefly because they were so few.

Under war conditions it was inevitable that prices for all food commodities should rise far above their level in pre-war years. But the control of the situation which was kept by the Food Administration and the carefully organized and consolidated buying of our own and other governments, enormous beyond comparison with any market situation in all the history of the world, reduced prices below what they were when we entered the war and kept them down to a level much lower than they would otherwise have reached. When we had been in the war for a year the Food Administration estimated that during that time the price of food commodities had decreased twelve per cent to the consumer and increased eighteen per cent to the producer. For instance, the price of flour, which reached a maximum in 1917 of $16.50 per barrel at the mill-door, at the end of April, 1918, stood at $10.50. Without the stabilizing influence of the Food Administration it would have mounted in that time, in the opinion of experts, to $40 or $50 per barrel.

The plea to conserve food met with enthusiastic response. In the spring of 1918, when there was dire need of more wheat for export, whole towns and counties, in some of the states, pledged themselves to use no wheat until the new crop should be available. A conference of 500 managers of first-class hotels and restaurants voluntarily gave their pledge to one another and to the Food Administration to use no wheat flour in their kitchens until the next harvest

was ready. Households innumerable throughout the land did the same thing.

We entered the war with only 20,000,000 bushels of wheat available for export. The need grew sharp in England and France and Italy and we sent them 141,000,000 bushels, having saved 121,000,000 bushels out of what we would ordinarily have eaten ourselves. Because the armies and the peoples across the ocean needed sugar, the request was sent forth that individual consumption of sugar should be limited to three and later to two pounds of sugar per month. Its consumption was voluntarily reduced by about one-third. In four months in the summer of 1918 we saved and sent abroad, out of our usual consumption, 500,000 tons of sugar. Increased production and conservation were responsible for 1,600,000,000 more pounds of pork products ready for export in the fall of 1918 than were available the previous year, while for the three summer months of 1918 the records showed an increase of 190,000,000 pounds of dressed beef.

An illuminating instance of the temper of the people in general toward conservation is afforded by the reports of railway dining cars for two months in the autumn of 1917, in which they saved out of their ordinary consumption 468,000 pounds of meat, 238,000 pounds of wheat flour and 35,000 pounds of sugar. During that time hotels and restaurants reported savings of 17,700,000 pounds of meat, 8,000,000 pounds of flour and 2,000,000 pounds of sugar. That there was a very general attempt to lessen waste of food in cooking and eating was shown by the fact that nearly all cities reported a considerable decrease, amounting in most of them to from ten to

UNLOADING WHEAT UPON A LIGHTER AT A FRENCH PORT

thirteen per cent, in the amount of garbage collected.

Because at the very beginning of our participation in the war we recognized the value of food, mobilized our food forces, enlisting the whole nation in voluntary service, and kept their operation under control for efficient war use, we were able to pour into Europe the food without which the Allied armies could not have continued their necessary effort and the populations behind them retained their health and morale. In the years before the war the United States sent an average of between 5,000,000 and 6,000,000 tons of food to Europe each year. In the crop year of 1918 we doubled that amount, sending 11,820,000 tons, and were prepared in the following year to send between 15,000,000 and 20,000,000 tons. In the midst of these bountiful harvests there were no food cards and the only rationing that was necessary was that prescribed by the individual conscience. But that conscience, with the universal enthusiasm for increasing production, enabled us to send to Europe in 1918 an increase over 1917 of $504,000,000 in the value of meat and dairy products and of $170,000,000 in breadstuffs. Our total contribution in 1918 to the food needs of Europe amounted approximately to a value of $2,000,000,000.

CHAPTER XXVIII

THE MANAGEMENT OF FUEL

IN the world war fuel fought, and food, and steel, as well as men. Fuel quickly became as much of a fighting necessity as were the munitions which could not be made without it and the food for whose transportation it was necessary. It was a war of manufactures, of applied science, and the foundations of both are laid in fuel. And therefore fuel, which means chiefly coal, had to be mobilized for war and its production and distribution so managed that its potency could be applied where needed and when needed without unnecessary detriment to civilian welfare. During the first months of our participation in the war and for nearly a year previous there had been a menacing coal situation in which the increasing demand for coal, inadequate transportation and storage facilities and other causes had combined to send prices to four and even five times their former level and to cause uneasiness and dissatisfaction among consumers and in the ranks of both labor and capital. As soon as Congress gave the necessary authority, in August, 1917, the President fixed schedules of provisional prices and appointed a Fuel Administrator for the United States.

Before the Fuel Administration was created there had unfortunately been published unauthorized and

unwarranted assurance of prospective better conditions in the coal situation which had led many to postpone their usual summer and autumn purchases. When the winter set in, at an unusually early date, with its unprecedentedly long continued and bitter cold and frequent storms, this delay on the part of so many buyers added much to the universal difficulties and discomforts. To all the usual demand for coal and the extraordinary demand due to the unwonted weather, there were added the large and increasing fuel needs for war manufacture, for the bunkering of ships, for the heating of the many cantonments and camps, each a goodly sized city in itself, and other war activities. And with all this increased demand, there were fewer workers in the mines, for many had joined the fighting forces or gone to work in munition factories, and transportation facilities were disorganized by the strain upon them and disabled by storms and zero weather. This was the situation with which the Fuel Administration was contending three months after it began its work.

The total coal production of the country during 1917 amounted to 651,402,000 net tons, of which approximately 100,000,000 tons were anthracite and the rest bituminous. This was an increase over all previous production records of more than 60,000,000 tons, but it did not meet the ever increasing demands of the war machine, whose requirements for bituminous coal for 1918 went above this amount by nearly 100,000,000 tons. It was necessary to stir production in the mines to utmost endeavor, to facilitate that production by prompt and adequate distribution and to induce such fuel saving among consumers as would supplement production sufficiently to meet war needs.

Not only was there a decrease of many thousands in the number of men employed in the production of coal, but also in many mines efficiency was lessened by the hatreds and suspicions of the different racial representatives—Magyar, Pole, Italian, Slovak, Jugo-Slav, with their animosities bred in the bone, brought with them from Europe and fanned into fresh activity by the war. Each furbished up anew his old grudge and carried it on his shoulder, where it quickly received the knocking it challenged, and old racial battles were fought over again while the mining of coal was laid aside.

To better conditions and stimulate effort a Production Bureau was formed in the Fuel Administration whose representatives were sent to every mine. There they worked with and through a committee composed of mine operators and mine workers. The Bureau bent its energies incessantly to the influencing of mine operators and managers to establish such conditions and methods as would keep the miners satisfied and busy and of the miners to put forth their utmost efforts. Its representatives dealt tactfully with the racial hatreds, using the foreign language newspapers read by each group and also dealing with individual men in person, allaying suspicions, and showing each group what the success of the Allied and American armies would mean for its people in Europe. Officials of the United Mine Workers toured the mining regions, addressing the workers, informing the men on the questions involved in the war and urging them to do their best. Other speakers, including men returned from army service in France, went up and down through the mining regions, holding meetings, talking to the workers. The

President's proclamation addressed to all engaged in coal mining and appeals from other men of influence among them were distributed everywhere.

The result was a hearty response from the mining men. They dealt amicably with the production committees, they kept the peace with their racial enemies, they agreed to forego holidays and the usual laying off for funeral days, they worked even on Labor Day, they plunged into the increased production program with enthusiasm, they worked more efficiently and many old men who had quit active work on account of age voluntarily took up again the pick and shovel. The average number of days worked by each miner in the bituminous fields was increased over that of the previous year by twelve and by twenty-five over that of 1916. From week to week during the summer and fall of 1918, until November, the weekly production of coal showed an increase in the neighborhood of a million tons over the same week in the previous year. During the half-year period from the first of April to the end of September more coal was mined than ever before in any half year in the history of the American coal industry. In that time the bituminous production was twelve per cent greater than in the corresponding period in 1917, which had itself established a record.

As important as increased production in the mines was the rapid distribution of coal as soon as it was brought to the surface. Coal is not commercially produced until it is distributed, for coal dumped at the mine mouth or lying in cars on railroad switches is of no more use to the consumer than that still underground. It was mainly the efficient work of the Railroad Administration that brought order

and successful achievement into this phase of the war coal situation. The manner in which it relieved the freight congestion which had paralyzed traffic during the last months of 1917 is described in the chapter on "Running the Railroads." By the prompt actions it took it released the tied-up trains of coal, sent them to their destination and made possible the swift, economical and steady service of all cars available for the carrying of coal from mines to consumers' bins.

But so much in excess of possible production was the amount of coal that was urgently necessary for war making purposes that only a great and general program of coal saving would prevent the slacking of our war effort. The Fuel Administrator turned at once to the American people, confident that, if they understood the need, they would voluntarily endeavor to meet it. Articles explaining the situation and showing why it was necessary for consumers to save in the neighborhood of fifty million tons of coal during the next few months in newspapers and magazines, all of which throughout the country cordially coöperated with the Fuel Administration, brought the responsibility of the continuing of the nation's prosecution of the war straight to the feet of every individual user of coal, gas and electricity. Widely circulated leaflets urged conservation of coal and posters that met the eye at every turn emphasized their message. Instructions were published in periodicals of every sort for the economical but equally efficient use of coal in manufacturing and domestic furnaces, in kitchen ranges and household stoves. To save each day at least one shovelful of coal was laid upon the conscience of every consumer.

So-called "lightless nights" were established on which was forbidden the use of electricity, gas, oil, or coal for the illumination or display of windows, advertisements or signs and street lighting was reduced to the minimum necessary for safety. In order to aid in the conserving of coal by reducing the amount of artificial light necessary, the daylight saving measure was passed by Congress and the clocks moved ahead for an hour from the end of March to the end of October. Non-war industries had their consumption of coal curtailed.

In January, 1918, the public east of the Mississippi River was asked to observe a series of so-called "heatless days" in which there should be no consumption of fuel except for absolutely necessary uses. The purpose was to make possible the bunkering of two hundred and fifty ships at eastern ports laden with food and war materials for Europe, but unable to move for lack of coal. There was dire need of their cargoes in France. The United States Government had been told that the Western Allies could not continue their war effort unless these cargoes were delivered on the other side of the Atlantic in the quickest possible time. For a five-day period in January and for each following Monday for several weeks the Fuel Administration asked commerce and industry to forego as far as possible the burning of coal in order that it might give priority for deliveries of coal to the waiting ships and to the newly established Railroad Administration, struggling with ice-covered tracks, frozen engines and storm-tied trains, a little time in which to relieve the congestion of cars and set in motion long lines of stalled coal trains. The "heatless day" period was loyally observed and by

the day after it ended every one of the two hundred and fifty ships had bunkered and was speeding across the ocean to deliver its sorely needed cargo. There had also been accumulated a stock of coal for the equally necessary bunkering of the other ships that came and went in a steady stream to supply the demands of war.

For all these measures the response of the public was immediate and willing. Manufacturers of non-essentials voluntarily offered to curtail operation if by so doing they could aid the nation's war effort. Domestic consumers reduced their lights and watched their furnaces and stoves as they had never done before, and everywhere any attempt on the part of merchants, corporations or private individuals to use light or fuel in excess of the Fuel Administration's requests and rules was frowned down by the public.

The Oil Division of the Fuel Administration played so important a part in the final success of the Allied and Associated nations that if it was true, as a British authority declared, that "we floated to victory on a sea of oil," the credit belongs largely to the men who directed the American oil supply, for the Western front was dependent almost wholly upon oil from America. There was a constantly increasing production of crude oil, which was speeded by all possible methods, and the proportion of gasoline extracted was continually being increased. Oil-burning vessels in the British, French, Italian and American navies needed the oil and the Motor Transport Services of all the armies needed immense and rapidly increasing quantities of gasoline. Oil production was increased in 1918 to 344,000,000 barrels, which was 50,000,000 barrels more than it had been in 1914.

To provide transportation a fleet of oil tankers was built and when the war closed over half the gross tonnage of tankers in service was American.

Gasoline this country sent across the ocean in an ever increasing flood which grew in 1917 by a million and a half of barrels over the previous year and in 1918 amounted to 13,312,000 barrels, an increase of more than 9,000 barrels per day over that sent in the previous year. But so sharp grew the need for it at the front in the summer of 1918 that restriction had to be put upon its use at home. The Allied forces warned by cable that without increased and early deliveries of gasoline their plans were likely to collapse. Marshal Foch's cablegram said bluntly, "If you don't keep up your petroleum supply we shall lose the war." Immediate saving of gasoline was the only answer to the necessity and the Fuel Administration asked the people living east of the Mississippi River to forego the use of motor-propelled vehicles, except for specified necessary purposes, on Sundays. Compliance was voluntary and for military reasons the public could not be told how dire was the necessity.

But so immediate and universal was the response that from every section reports showed that Sunday motoring was almost wholly abandoned, the reduction being from 75 to 99 per cent. During the nearly two months that the restriction continued it was estimated that a saving had been made of approximately 1,000,000 barrels of gasoline, of which more than 500,000 barrels, ten shiploads, had been sent overseas.

A comprehensive plan was worked out by the Fuel Administration for the saving of fuel by conservation

of light and power which enlisted the aid of a force of engineers and of other departments of the Government. A study was made by inspectors and engineers of conditions in large manufacturing concerns and in public utilities plants all over the country which brought about, by the willing coöperation of their managers, such rearrangements of machinery and appliances, elimination of duplicating plants and of unnecessary expenses as resulted in important savings, ranging from ten to thirty per cent in the amount of coal consumed, without interfering with the output. The Fuel Administration urged the generation of electric energy from water power instead of steam wherever possible, and enough plants made the change to effect a considerable saving in coal consumption.

A zone system for the distribution of bituminous coal providing for the supply of each section of the country from the nearest mines, put into operation by the Fuel and Railroad Administrations together, eliminated approximately 160,000,000 car miles and affected more than half of the total distribution of bituminous coal. The overcoming of this waste in transportation made possible the swifter and steadier use of rolling stock, thus speeding deliveries and more quickly returning cars and engines to the mines for new loads, and made more effective the railroad consumption of coal, which amounts to about twenty-five per cent of the coal production of the country.

The organization of the Fuel Administration stretched out in a network that touched every community. The fuel administrator of each state, working under the national organization, had under him administrators and local committees for cities and

counties whose duty it was to keep in constant touch with the supplies and the needs of their own localities. Upon their reports the state administrator apportioned the supply to be allowed each locality and upon their investigations into business costs were based the maximum local retail prices of coal to be charged. The fixing of local retail prices was in addition to the regulation of prices at the mines and violators of either, whether mine operators, jobbers or retailers, were made to refund their excess profits and were then turned over to the Department of Justice for prosecution. Each of the several divisions of the work of the Fuel Administration, in addition to that of fuel distribution, such as conservation, production and oil, was organized by districts or specialized bureaus for intensive and effective work.

Economies urged by the Fuel Administration resulted in the saving during the first half of 1918 of 12,700,000 tons of coal. Although the coal mining industry lost 100,000 or more workers to other war industries and to the fighting forces, the speeding program of the Fuel Administration resulted in a production of bituminous coal during 1918 of 585,883,000 tons, setting a new high record and exceeding the production of the previous year by 34,000,000 tons. Notwithstanding the enormous and constantly growing increase there had been throughout the preceding eighteen months in the consumption of coal for war purposes, at the end of hostilities the country faced the approaching winter with stocks of coal on hand greatly in excess of previous years.

CHAPTER XXIX

THE SPIRIT OF THE PEOPLE

THERE could not have been a spirit more eager for service, more inspired by patriotic zeal, more willing to do whatever would aid the Government in its prosecution of the war or support the efforts of the fighting forces than was manifest among the great masses of the American people. Whatever they were asked to give to provide the means of war, whether by taxation, by buying of bonds, by outright gift, by sacrifice, by personal effort, they gave with ungrudging heart and overflowing hands. They offered their sacrifices and volunteered their effort without waiting to be asked and they spontaneously aligned themselves in every organized activity for the war and joined their voluntary efforts together for the nation-wide team-work that alone would make it a success. The sense of personal responsibility, the understanding of the importance of individual effort, had a new birth in their hearts and the deep-lying springs of love of country gushed forth anew at the call of her need. There could not have been a more triumphant vindication of the worth to humanity of American institutions and American ideals than was given by the spirit manifested by the American people throughout our participation in the world war. So high, eager and intense, indeed, was the general

wish for rapid progress in war production and war making that its desires frequently outran possibilities and led many to demand results that only a miracle could produce.

Men of trade, industry, engineering, of all manner of business and professional life willingly agreed to the curtailment, even the complete stopping of their own affairs if the Government needed their services, their supply of coal, or their raw materials for its war production, or turned to its uses the ships in which they were accustomed to import or export their goods. In and out of the various committees, boards and administrations that directed the country's business life for war purposes went a constant stream of these men, anxious only to serve their country and ready to make any sacrifice for America's sake. "Tell me what you want, let me know what I can do, and I'll do it," was their unvarying appeal. Every official and every civilian in the temporary service of the Government who came into contact with the business and professional men of the country will bear witness to the patriotic and self-sacrificing spirit that was shown by them from the moment the nation entered the war. Over and over again these officials, permanent and temporary, have said to the writer of this book, in answer to her inquiry as to the spirit of those of whom they had had to ask sacrifices of this sort: "They've been splendid"—"Their spirit couldn't have been finer and more patriotic"—"My experiences with them have made me prouder than ever to be an American and a fellow citizen of such men."

Great numbers of these men, scores of them, leaders in all kinds of business, experts in technical and

engineering fields, gave up their high-salaried positions or left their offices in charge of subordinates and offered their services to the Government. It was a war in which the scientific expert at home, the man of business, the engineer, was of equal consequence with the fighting man and the sum of the ability, the knowledge and the experience thus put into the hands of the Government could not have been purchased at its market value for millions of dollars.

As the Government is forbidden to accept free service they were paid a nominal sum and were known as "The Government's dollar-a-year men." Putting their own affairs aside they worked with zeal, long hours and incessantly, drawing upon their knowledge and their connections, making engagements and holding conferences indifferently for noon or midnight, that the nation might get itself upon a war footing quickly and efficiently and make its war stroke mighty and decisive. The chairman of one of the Government boards who had come in contact with many of these men and was familiar with their private position and importance in the business world estimated that they were sacrificing profits and salaries that would aggregate as much as $30,000,000 per year.

The response was equally zealous in every phase of life. Periodicals of every sort—daily and weekly papers, magazines, trade journals—opened their columns for the publication of articles that made known what the Government needed and thus circulated far and wide, through city, town and country, information concerning the need for food production and food conservation and how these could be accomplished, and how and why fuel should be saved, con-

cerning the Red Cross, Liberty Loans, War Saving Stamps, pro-German propaganda. They gave the use of their advertising columns for campaigns for the collecting of money for war sufferers and for the big-brothering of our own fighting men. An expert estimate of the value of this donated space put it at $2,000,000. Hundreds of pages for these and similar purposes were paid for also by business firms. Department stores gave the use of show windows for displays that would aid war work and war relief organizations. Artists and illustrators turned their pencils and brushes to the work of making posters and illustrations for the Food and Fuel Administrations, the Labor Department, the Shipping Board, the Liberty Loan and Savings Stamps campaigns, and other work that would aid in prosecution of the war, giving in all about three thousand poster designs, cartoons, paintings and drawings.

Chambers of Commerce and other business organizations had their war service committees which were on the alert for ways in which such bodies or their individual members could serve the nation. There was hardly a woman's club in the whole country but had its committee for war work which brought its members into line for war service of varied sorts. Churches and religious bodies set themselves to raise money and to give personal services that would be not only contributions toward the winning of the war but would also be of deep and abiding influence upon the national life. Their members and committees held meetings to further the cause of America in the great war, distributed war literature, furnished workers for the various campaigns for war purposes and war relief, gave Bibles by the hundred

thousand to the fighting forces and in the quickening of Christian spirit which was born out of the tense emotions of the time the various denominations united their hearts and hands as they had never done before in common service for the needs of the country.

Young people and children were anxious to do their share, however small, in work for the war. The Boy Scouts were especially efficient and eager in many kinds of service. They sold millions of dollars' worth of Thrift and War Savings Stamps; they gave noteworthy aid in every Liberty Loan campaign, securing over a million subscriptions; they were active and helpful in the uncovering of certain forms of enemy activity; they located for the Government quantities of walnut trees and groves whose timber was much needed for airplane and gunstock production. Girl Scouts also were busy and useful in the Liberty Loan campaigns, in the selling of Thrift and War Stamps, the cultivating of war gardens, the making of sandwiches and dainties for hospitals and canteens and in Red Cross service. In the School Garden Army for the summer of 1918 there were enrolled 1,500,000 children under sixteen years of age whose garden work produced an amount of food worth an average of $10 for each child. When the armistice was signed the plans were well under way for the tripling of that number of members for the following year. The Boys' Working Reserve, which admitted only boys over sixteen, had 250,000 members who spent the summer of 1918 in work on farms and in truck gardens. Boy Scouts and Girl Scouts and other boys' and girls' clubs diligently collected nut shells and fruit pits needed for the

making of gas masks. In schools all over the country children to the number of nearly 10,000,000, from the kindergarten to the high school, were enrolled in the Junior Red Cross and as its members they sewed and knitted and folded bandages, raised money for its service in many ingenious ways, saved food and money and salvaged all manner of household wastes. As "Victory Boys" and "Victory Girls" they enlisted by the thousands to aid in the great campaign which in November, 1918, raised over $200,000,000 as a war-chest for the seven chief welfare organizations working with the American fighting forces, each one of them agreeing to earn a certain amount for this war service.

The great body of industrial workers, with few and unimportant exceptions, united in the single-hearted and patriotic purpose that moved the whole country. There were some frictions and difficulties, due in part to the workings of enemy agents among them, in part to the influence of racial animosities among those recently come from Europe and in part to the rapidly rising costs of living. There was also in the early months among the foreign born lack of understanding of the issues at stake and the reasons for America's participation in the war. But adequate information, the clearing out of enemy influences and the efforts of the War Labor Administration to make equitable adjustments of all difficulties between employees and manufacturers soon brought the great mass of workers to enthusiastic support of the nation's war efforts.

The wonderful story of the financing of the war would have no chapter more interesting and thrilling, if only the facts concerning it could be gath-

ered together, than that which would relate the aid given by industrial workers the country over who bought bonds and stamps to the full extent of their ability. The enthusiasm and unanimity they showed in shipyards, munition plants, coal mines and all places engaged in war production work proved their appreciation of the ideals at stake. In one large munitions plant they worked on Labor Day, offering their time without compensation, in order to give to that holiday a new and more solemn significance. In many manufacturing concerns, shipyards and mines they were willing to forego all the usual holidays in order to increase the output. In plant after plant the employees pledged themselves to work steadily without stop or hindrance and to give their utmost endeavors to their share of the upholding of the men who had gone overseas. Members of the War Labor Administration who took part in the adjustment of difficulties were enthusiastic in their commendation of the loyal spirit shown by the great body of employees and their desire to give their full and hearty support to the Government's program of production for war purposes.

In nothing did the spirit of the people have more enthusiastic and practical expression than in the effort to increase the production of food which enlisted the services of men, women and children in every walk of life, in cities, towns, villages and country regions, from end to end of the land. It has already been told, in "Feeding the Nations," how marvelously that production of food was increased. Farmers everywhere, under the spur of the great need, added, if they could, to the area of their cultivation, worked longer hours, and endeavored to improve

their methods, while their wives and children took charge of barn-yard chores. Business men in country towns coöperated by lending financial assistance where it was needed. In agricultural states whole communities, or even whole counties, sometimes organized themselves upon a sort of coöperative basis for increase of food production, people in the towns providing needed labor and money.

Business and professional men frequently took their vacations or spent week-ends upon farms, lending a hand in farm labor. Women took up farm work and, as told in "The Work of Women for the War," a goodly sized army of them aided in the raising of more crops. The home war garden movement swept the country with enthusiasm and in the summer of 1918 planted over 5,000,000 home plots that produced more than $500,000,000 worth of food. In New York City there were in that year 64,000 of these home war gardens, besides the school gardens, the number exceeding even that of the gardens of London. The patriotic, mounting spirit of the people caused the tillage in 1918 of an increase in food producing acreage of 10,700,000 acres, whose produce excelled the value of that of the previous year, itself a record, by $614,000,000.

There was everywhere the greatest eagerness to do anything for the men of the Army and the Navy that would give them help or pleasure. The story of the organized effort for that purpose is told in "Big Brothering the Fighting Forces." But, in addition, there were numberless movements of smaller scope that enlisted the aid of many people. Hundreds of thousands bought "smileage tickets," for seats in camp and cantonment theaters, and donated

them to welfare organizations for distribution among soldiers and sailors. Many newspapers, clubs and business concerns collected money for the "smokes" of which the Army and the Navy consumed enormous quantities. The support of these tobacco funds enlisted the aid of men, women and children who gave money, organized entertainments, solicited help, did a thousand things to help swell the total. The value of the tobacco, cigars and cigarettes thus contributed for the comfort of our soldiers and sailors amounted to many hundreds of thousands of dollars.

The navy needed binoculars, opera glasses and telescopes, and over 50,000 patriotic Americans sent their instruments. Quantities of musical instruments were donated for use in camps and at sea. The work of collecting and distributing phonographs and records was organized into a system that included the whole country, and machines by the hundred and disks by the thousand were given or loaned to it or bought for it and sent out to camps and hospitals, to troop transports, battleships, cruisers, destroyers and in great quantities to the men overseas. The Over-There Theater League, organized and directed by men prominent in theatrical affairs, included among its members and supporters practically all the theatrical managers and the important people of the stage in the United States, all of whom gave their services for the providing of theatrical entertainment for the men overseas. Moving picture actors and managers contributed services to the Liberty Loan campaigns and other phases of war effort.

Old men and women who were too disabled to do anything else joined the ranks of the knitters and

made helmets, sweaters and mufflers, to go with the mountainous stacks of these articles made for the Army and the Navy. Hundreds of ministers, college and university professors and other professional and business men spent in the shipyards, or in munitions factories or on the farms their summer vacations of from two to twelve weeks, while some of them even gave up their positions in order to remain in this most necessary work. Many people owning country homes or estates turned them over to the Government to be used as hospitals or convalescent homes for wounded men. Every community in or near which were camps of any sort opened its homes to the soldiers and sailors and gave them hospitality, friendship, entertainment.

When the Red Cross asked for 5,000 tons of clothing for the destitute in France and Belgium the people gave it 10,000 tons. Successful men of business gave their time, their experience, their best thought and work to the directing of relief organizations. There were many of these, perhaps two score, in addition to the seven most important and every one of them was generously supported. So willing were the people to give that crooks and criminals made rich harvests by collecting money under false pretenses. Many millions of dollars were stolen in this way whose givers believed it was to be used for the benefit of their country's fighting men. It was estimated by those familiar with the work of the relief organizations that the American people contributed for these several welfare purposes close to $4,000,000,000.

Throughout the war the American people gave whatever was needed for its prosecution, whether

themselves, their loved ones, their energy, their labor, their time, their thought or their money, with an ever increasing ardor of patriotism and intensity of purpose. A spendthrift and wasteful nation disciplined itself to the practice of care and economy, and a nation of individualists, jealous of personal rights, acceded willingly to Government interference in private business and Government control of business relations for the sake of the country's need. Hating war with a profound unanimity of feeling and conviction, the whole people joined hands with an equal depth of conviction and feeling that this war must be pushed through to a victorious conclusion in the quickest possible time.

The spirit of the American soldiers at Belleau Wood and in the Argonne Forest was the same spirit that animated the people at home and it brought the whole nation into a closer union and a more understanding comradeship than it had ever previously known. In the army at the front were three hundred thousand negroes, among the most valiant of its fighters; representatives of fourteen tribes of Indians, as contemptuous of death as any of their forefathers and as devoted to their country as any of their comrades; men of almost every racial strain under the sun, and all of them loyal soldiers of America. And, just as all these troops in uniform were joined together in the democracy of their crusading spirit, so all the people of the nation behind them were joined together in feeling and effort and purpose—the purpose that America should win the war for democracy's sake, the utmost effort needed to realize that aim, a passionate patriotism that blazed at white heat in every heart.

The occasional rumbles of dissatisfaction that were heard in some of the centers of alien population during the first months of our participation in the war, due chiefly to enemy propaganda of one or another form, soon ceased as better information was spread among them and the country's cause had no more whole-hearted and self-sacrificing support than was given by those same crowded centers of foreign born people. Thoroughly representative of this rapidly changing spirit and of our foreign-born citizens throughout the land was the East Side of New York City, where German propaganda and disloyal socialism together did their best to create trouble. But the American Army contained no better and more valiant soldiers and none more inspired by the crusading spirit than the thousands of lads from that region, whose unyielding courage, soldierly qualities and loyalty to their comrades in battle won the praise of all who shared with them the dangers of shell fire, gas and machine gun bullets.

And just as fine and staunch in its different way was the patriotism of their families at home, for whom the absence of their men meant much self-sacrifice and even sometimes serious financial troubles. But they proudly hung their service flags in their windows and supported the Government's war program in every way in their power. Their purchases of thrift and war stamps constantly increased and in the second Liberty Loan campaign they more than doubled their subscription to the first, in the third they multiplied their subscription to the second by sixty and in the fourth they more than trebled their subscription to the third, buying in it $50,000,000 worth of bonds.

It was on the East Side of New York City that the "block party" had its birth—unique fruit of the war and symbolic of the war's influence upon the people of the nation. For such a party all the people living in a block, or several adjoining blocks, decorated their houses and the street with flags, colored lanterns, ropes of greens, bright fabrics; and on the appointed night everybody swarmed into the street and to the accompaniment of music and cheers speeches were made, a huge service flag, with a star for every man of the block in service, was strung across the street and then all the nations and races represented among them told one another the news they had heard from their soldier and sailor lads, sang patriotic songs and danced on the pavement and sidewalk all the rest of the evening. Soon the block party spread to all parts of the city and established itself even in the exclusive residence districts where men, women and children, janitors and those whom they served, house maids and mistresses, met on the pavements, talked and sang and cheered and danced together as the service flag of their block was swung to its place and floated above them, their bond of union in common devotion to their country.

The block party, although it did not make its appearance in just that form in all sections, yet was significant of what was taking place in the hearts of the people all over the land. For out of their universal spirit and its white heat of devotion was being born a fresh realization of democracy and of its meaning to humanity and a new dedication to its ideals.

CHAPTER XXX

LABOR AND THE WAR

SUCH vast quantities of manufactured products—machines, munitions, clothing, food, supplies of every sort—were consumed in the war and had to be speedily produced for immediate destruction that for the first time in the history of the world the forces of production at home became of as much consequence for the winning of the war as were the fighting forces at the front. This fact, because it was so new a feature of warfare, was not at first recognized by the Entente Allies in its full significance and consequently their efforts lost much in possible effectiveness during the first year or more of the struggle. Nor did the United States at once realize the necessity of mobilizing the productive forces and directing their employment along lines that made for martial efficiency. But the first few months of war effort developed friction between employers and employed, competition in the bidding for labor by the various war agencies of the Government and the private employers engaged in production of war necessities, bungling and waste in the distribution of labor and a tendency to backsliding in labor conditions. The Government had become the greatest employer of labor in the world and it soon became evident that to correlate the activities of all its war making agen-

cies and induce efficient coöperation between them and private employers new machinery would have to be devised for the handling of the forces of production.

For this purpose there was created the War Labor Administration, including in its machinery and its duties those of the Department of Labor, but expanding such of them as dealt with labor in its relation to the war and adding others that would meet new needs and aid in the solution of new problems, with the Secretary of Labor as its responsible head. In order to carry out the immensely enlarged program which war emergencies made necessary in a broad, comprehending and coöperative spirit, the Secretary called to his assistance an Advisory Council whose members represented all phases of interest in industrial work. To its preliminary study and careful planning was due in large measure the efficient and harmonious working of the big undertakings of the War Labor Administration. By its advice and as a part of the machinery for the correlation of effort there was devised the War Labor Policies Board on which were represented the War, Navy, Agriculture and Labor Departments, the Fuel, Food and Railroad Administrations, the U. S. Shipping Board Emergency Fleet Corporation and the War Industries Board, and to which were attached advisers representing labor, business management and technical fields. It unified labor policies and harmonized the industrial activities of the different branches of the Government, ensuring more efficient team-work for the prosecution of the war.

The War Labor Policies Board was thus the organization through which spoke the voice of all the

industrial agencies of the Government and behind its administration of industrial relations was all the power of the Government. It worked out a national policy for the distribution of labor which was executed through the agency of the United States Employment Service. By means of conferences between the representatives of organized labor and industrial management it did much toward the standardizing and stabilizing of wages. It endeavored to bring about proper standards and satisfactory conditions of labor. By anti-child-labor regulations in all Government contracts it kept a restraining hand on the evident tendency toward employment of children that had been induced on the part of employers by the need for labor and on the part of parents by the possibility of greatly increased earnings. It adopted a policy toward the employment of women in industry which aimed to keep women out of unfit occupations and to provide such standards and conditions in the occupations to which they were admitted as would conserve their health and welfare. It advised the more general employment of older men for many kinds of work rather than that of women or boys, and largely because of its support of this policy the age of engaging men advanced during the war by ten years, until men of fifty were able to find employment.

The first task which the War Labor Policies Board undertook was that of bringing order out of the chaotic condition which had quickly developed through the bidding for labor against one another of all employers, both public and private, and the working out of a national policy for the distribution of labor. The existing machinery of the United States

Employment Service, very greatly enlarged and strengthened as soon as funds for that purpose were available, was used in the execution of this policy. Offices were established in the several states, their number soon totaling 400, and a decentralized system was worked out consisting of state and community labor boards, upon all of which there was joint representation of employers, employees and the United States Employment Service. These made it possible to list and keep constant check upon the supply of labor and the demand for it in every part of the country and within a very short time to move an excess of the supply in one place to another in which there was need. These community labor boards were organized in every state of the Union and by the first of September, 1918, were at work in 1000 industrial centers. In every application for work the schooling and the occupational experience and training of the applicant were stated, thus making it easy to match the job with the man. By the end of the summer the U. S. Employment Service had made placements of almost 2,000,000 wage earners.

The production departments of the Government agreed to employ unskilled labor only through the U. S. Employment Service and private employers, with very rare exceptions, were quickly brought to see the necessity of coöperation and readily responded to the plea that was made to their patriotism and their intelligence. The Employment Service aided in the weeding out of men from non-essential industries and helped to transfer them to those upon which the nation's life depended. It gave efficient assistance also in the important work of preventing the drafting into the army of skilled workers whose labor

was needed in war industries. Through its 15,000 enrollment agents it reached out into towns and villages, tapped every potential supply of wage earners, and registered in advance men for specified trades for which one or another war emergency would soon make demand. Its division for farm service made it possible to harvest the 1918 crop with far less than the usual loss due to lack of harvest hands, notwithstanding the fact that there was little unemployment in any part of the country. For the guidance of boys in their latter teens the section of the U. S. Boys' Working Reserve directed the work in 1918 of 250,000 boys of high school age who wished to devote the summer vacation to productive civilian work that would aid the prosecution of the war, exercising upon this great body of future citizens through various agencies and by varied methods a notable influence for manly spirit, patriotism and citizenship ideals.

A section of the War Labor Administration that had under its charge the informing of the public as to its activities and the education of those engaged in war emergency production was a part of the democratic methods of the whole national war program and did much to stimulate patriotic effort and bring divergent interests into harmony. Through thousands of magazines, newspapers and periodicals of every sort it brought the efforts being made by the War Labor Administration to general knowledge and aroused interest in industrial problems. It sent out hundreds of speakers who talked upon subjects dealing with labor and the war before chambers of commerce, clubs, trade unions and other organizations, and meetings of employees in plants devoted to war

industries. It distributed 1,000,000 posters a month, which, changed every two or three weeks, were displayed in workshops, factories, stores and railway stations, and it supplemented these and the spoken word with a campaign of motion picture service. It formed committees among the employees of over 12,000 plants to establish personal contact between those employed in war industry, their employers and the representatives of the Labor Department, promote better understanding between them and so increase production.

A serious problem grew early in the war out of the immense expansion in size and man-power of plants engaged in war industry and the creation of many others—the problem of the housing or transportation of their employees. Almost overnight the population of the vicinity of an industrial plant would increase so greatly that transportation facilities would be swamped and housing accommodations become utterly inadequate. Appropriations amounting to $100,000,000 were provided for the solving of this problem, half of which was to be devoted to industrial housing. At the end of September, 1918, houses, apartment houses and flats capable of accommodating 9,000 families had been built or were under construction and financial allotments had been made for as many more projects which were under consideration and about to be developed. To relieve situations where it was possible for the incoming workers to be absorbed by surrounding or nearby communities there had been built up in more than fifty cities organizations in which councils of defense, chambers of commerce, housing associations, Y. W. C. A. and other local bodies coöperated with

this division of the War Labor Administration. Such an organization would investigate living conditions and list vacant houses, flats and rooms, frequently showing the existence of sufficient housing facilities to make construction unnecessary.

Among the most important of the agencies developed by the War Labor Administration was that of the National War Labor Board, created for the purpose of adjusting difficulties between wage workers and employers in industries directly or indirectly concerned with production for the war. It was appointed by the Secretary of Labor at the end of our first year of participation in the war and consisted of five representatives each of employers and wage-earners and two joint chairmen acceptable to both sides. It served as a sort of court of appeal, only such cases of disagreement being considered by it as the Conciliation Service of the Labor Department failed to adjust.

In form and purpose the War Labor Board was a new departure for even a democratic nation to take. It had no precedents behind it and no body of law with which to enforce its decisions. To make its work effective it depended upon the general sense of justice and fair play, the confidence of workers and employers in the justice of the policies by which it was guided and the loyalty and patriotism of both the opposing sides of industrial controversies. Its purpose was to secure maximum production of all war necessities by preventing strikes and lockouts, and also proper conditions of labor and of living that would aid in making possible that maximum production. With regard to labor unions the Board based all its procedure upon the right of labor to organize

and to bargain collectively with employers, but forbade any coercion by labor unions or their members of either employers or employees. Employers were not allowed to discharge workers or to penalize them, directly or indirectly, for attempting to organize, although shops were to be continued as closed or open, on their existing status, for the period of the war. In open shops the union standard of wages and conditions was to be maintained. The Board would not use its power to compel open shops to become union shops, but employers agreed to recognize the right of the employees of a shop to form a full organization of their own members if they chose. The Board recognized the basic eight-hour day as applying in all cases where required by the existing law and in other cases it pledged itself to settle the question with due regard to the welfare of the workers and to governmental necessities. In the case of women workers it insisted upon equal pay for equal work and said that their tasks must be proportioned to their strength.

The National War Labor Board called to its aid a large number of men and women trained in the investigation of labor problems and when its services were necessary the case was studied by several of these agents, the sides respectively of labor and of management being investigated each by those sympathetic with its point of view. They studied each case on its own merits, listed the grievances, collected evidence and selected witnesses to appear before the Board. In some cases, in order to expedite the work, trained examiners conducted hearings at which both sides were represented and then reported to the Board with an analysis and summary of the case.

At the date of October first, 1918, the offices of the National War Labor Board had been invoked in 531 controversies involving the employment of more than 2,000,000 workers, of which 266 were still pending. Awards had been made directly in forty-four cases, others had been referred to other governmental agencies or settled in other ways, and others had been withdrawn or dropped. In only four cases had the members of the Board failed to come to unanimous decision concerning the award and in only three instances had there been refusal to accept its conclusions. In two of these cases the result was the taking over by the Government, in one, of telegraph and telephone lines, and in the other of a munitions plant, while in the third, also a munitions plant, the striking workers decided, upon appeal to their patriotism, to accept the award and to resume work.

The work and the decisions of the National War Labor Board had a profoundly beneficent influence upon the war production of the country, reducing to a minimum the deterrent effects of labor troubles. The policies to which it pledged itself and the general confidence in its purpose to deal fairly with both sides greatly decreased the probable number of cases of serious trouble, as in many which otherwise would have grown into strikes or lockouts the opposing parties found they were able to settle their differences between themselves. The work of the Board raised the wages directly of approximately a million workers and of perhaps twice that number indirectly and it strongly influenced for the better the relations between wage earners and employers.

The just and scientific management of labor problems in connection with the war resulted in a mini-

mum of labor trouble, an enthusiastic and patriotic response of labor to the needs of the nation and an enormous and very slightly interrupted production of all goods needed for war purposes.

CHAPTER XXXI

BIG-BROTHERING THE FIGHTING FORCES

NEVER in all the history of wars was an army so big-brothered, its welfare so lovingly and efficiently cared for, as were the fighting forces of the United States in the world war. To the whole nation, from President down to street gamin, they were "our boys," seldom spoken of by any other term, and whatever the nation thought they wanted and could have it gave with full heart and overflowing hands. At the very beginning of our war effort, the desire of the War Department that the men should be so environed and trained on this side the ocean and so cared for on the other that they should be not only better soldiers but also should return to their homes better men than when they left, with no scars other than the honored ones gained in battle, and its initial undertakings toward that aim won instant and whole-hearted response from end to end of the country.

Various organizations, to the number of a dozen or more, some of them newly created and others of long life and experience, were soon working, with their hundreds of thousands of members, for the health, the comfort, the welfare, the happiness of the men of the fighting forces. The twin Commissions on Training Camp Activities for the Army and

the Navy entered at once upon their program of activities in all the cantonments and camps for the training of soldiers and sailors. Their athletic directors, boxing instructors, song leaders, theater managers, dramatic entertainment coaches were all experts in their several lines and took up with enthusiasm the work of furnishing entertainment and recreation and of training the men to provide entertainment for themselves. These two commissions were appointed by the War and Navy Departments and were a part of the system of training for war. They have been described in the sections dealing with the Army and the Navy and, except for the approval and support given to them by the whole people and the coöperation with them of civilian agencies, do not rightfully belong in an account of how practically all the nation stood on its tiptoes behind the fighters in its zeal to serve them and care for them. These two commissions, while they were similar to the other agencies in methods and spirit, were of governmental origin, support and direction, while the others were civilian.

The activities of the civilian societies gave expression to the heart of the whole people. At first they worked separately, each supported by its own members and followers, but after a time smaller societies merged themselves in or coöperated with larger ones and the seven chief organizations which finally comprised the bulk of the effort so arranged their work as to avoid duplication and overlapping and so eliminate waste. These seven were the War Camp Community Service, the Young Women's Christian Association, the Salvation Army, the Jewish Welfare Board, the Knights of Columbus, the Young Men's

Christian Association and the American Library Association.

Supplementing the work of the Commissions on Training Camp Activities for the Army and Navy, the War Camp Community Service operated in the regions immediately surrounding or near the training camps. It bettered moral conditions in camp environments, provided sleeping quarters, baths, canteens, information booths, clubs, reading rooms, arranged dances and theatrical entertainments, served as a medium through which the hospitable desires of the community might reach the men, thus making possible their entertainment in hundreds of thousands of homes. Its work was established in one hundred and twenty-eight cities, in every state in the Union, and two million men registered at its clubs. In the work of the Service in New York City alone one million men in uniform were provided with beds and baths, it had 9,000 beds available every night, it served meals to more than 50,000 men, 75,000 soldiers and sailors attended its dances and almost as many were taken on Sunday sight-seeing trips through the city, while hundreds of thousands enjoyed the theatrical entertainments it furnished.

Coöperating with the War Camp Community Service, the National League for Women's Service with its 300,000 members ran its own clubs and canteens, furnished workers for those of other organizations and for information booths, recruited a Woman's Motor Corps whose members were ready for work as motor drivers for any war service oganization, served as the distributing agency for florists all over the country who contributed flowers for the wounded in hospitals, and collected and sent books, magazines,

games, phonographs and records to army and navy camps at home and overseas.

The Over-There Theater League, under the leadership of men prominent in the theatrical world, secured actors and actresses, arranged theatrical tours, staged entertainments and, under the auspices of the Y. M. C. A., carried their performances from camp to camp. During the "Slacker Record Week" 15,000 men and women engaged in the campaign to secure phonographs and records to be sent overseas for the pleasure of the soldiers. To provide moving pictures for the camps at home and on the other side a great number of writers, actors and producers worked with zeal, and the Community Motion Picture Bureau, in charge of the service under the Y. M. C. A., made careful investigation to find out what kind of pictures were best liked in the different places. In the camps and cantonments at home it showed 8,000,000 feet of films per week. It had 2,000,000 feet of films in service on the transports that carried the troops to France. Its films were sent out to the ships of the Atlantic fleet and circulated from one cruiser to another. In France, and wherever there were American troops, the movie was ready for their entertainment in camps and hospitals from the port of debarkation to the rear of the firing line.

The contribution of the Y. W. C. A. to the work of big-brothering the army gave a peculiar touch which, unprecedented in war as the whole movement was, carried in a still more unusual and original way the atmosphere of the home and the influence of the social fabric through the training camps and across the ocean. In more than a hundred camps and cantonments its Hostess Houses, accommodating from

500 to 5,000, offered welcome to women friends and relatives visiting soldiers and sailors. The Hostess House, with its flowers and rugs and easy chairs, its desks for writing and tables offering books and magazines, its cheerful, blazing fireplace in winter and its verandas in summer, its pleasant and well conducted cafeteria and its general homelike air, was a charming bit of the outside world set down in the midst of military activities. There mother, wife, sister, sweetheart, friend could meet her soldier or sailor lad, could spend the night if necessary and have good, inexpensive meals. It was the scene of many impromptu weddings, the hostess of the house and her assistants taking charge of the arrangements, when lovers decided suddenly to be married before the ocean and the chances of battle should separate them. The Y. W. C. A. carried its work to France, and in its Hostess Houses there looked after the welfare of the women workers for the American Expeditionary Force and its canteens followed the American troops even to north Russia, where they were established in Murmansk and Archangel.

All of the great religious bodies of the country joined at once in the effort to lessen for the army and navy men the hardships of war, to surround them with as many as possible of the comforts of civilized life and to uphold them physically, mentally and morally. People of Protestant faith gave their support mainly to the long established and widely reaching organization of the Y. M. C. A., members of the Catholic Church, working through the National Catholic War Council, supported the endeavors of the Knights of Columbus, and the Jewish Welfare Board, with American Jewry behind it,

turned its attention especially to soldiers of that faith. And the Salvation Army, with its years of experience in caring for the needs of humanity and upholding morale, was early in the field. All these organizations coöperated in the most cordial way, supplementing one another's effort and joining their endeavors whenever the best results could be gained in that way, two or more of them sometimes using the same building. The friendly hand, the good cheer, the comforts each had to offer were ready for any man in uniform without a thought as to his religious affiliations. Each held its religious ministrations in reserve for those who asked for them and, for the rest, based its abundant and many-sided service solely on the desire to help the American Army fight the battle of justice and liberty. Their one purpose was to big-brother the fighting forces of the nation and, whether in training camp or debarkation port, on transport or battleship, behind the lines in France or at the very front, to be ready with whatever help and cheer and comfort it was in their power to give when it was wanted.

The Jewish Welfare Board was the youngest of all these organizations, having been formed after our entrance into the conflict for the purpose of helping to win the war by carrying out the policies of the War Department with regard to the welfare and the morale of the soldiers. Behind it were three and a half million citizens of the Jewish faith and, while it functioned on its religious side for the benefit of the 175,000 men of the Jewish religion in the Army and Navy, in all its other activities it was nonsectarian and worked as generously and cordially for one as for another. In the training camps of the

IN A RED TRIANGLE HUT IN THE BATTLE ZONE

Army and the Navy in the United States it had many huts and nearly three hundred field workers who arranged entertainments, classes and study groups, provided religious services, and taught the English language and the principles of American citizenship to men new to America. In two hundred communities near training stations the representatives of the Welfare Board coöperated with the War Camp Community Service in all the phases of its activities. Overseas it had headquarters in Paris and at the end of hostilities it was preparing to establish others at debarkation ports and in cities near the large camps of the A. E. F. and was ready to send a hundred men and women workers to take charge of them. Its club rooms in Paris were equipped with books, music, games and other means of social enjoyment and the organization, by coöperation with a French society, arranged to have Jewish soldiers entertained in French homes of their own faith. Through the suggestion of the Welfare Board a number of rabbis were commissioned as chaplains with the fighting forces, each of them being provided with a monthly allowance to expend upon small comforts for his boys. They held Jewish holyday services back of and almost in the front line trenches, in cities and villages, once in the ruins of a Roman Catholic Cathedral and again in a large Y. M. C. A. hut. At one service, at which the rabbi, coming from another sector, arrived a little late, he found that the local Knights of Columbus Chaplain had kept the meeting together for him and opened it with a preliminary prayer.

The National Catholic War Council, organized to direct the war-aiding activities of all Catholic forces,

operated a million-dollar chain of Visitors' Houses at army and navy training camps and of service clubs in communities and embarkation ports, where it worked in coöperation with the War Camp Community Service. Under its supervision was the society of the Knights of Columbus which, at the close of hostilities, had in the United States several hundred buildings and 700 secretaries and overseas more than a hundred buildings and huts, with many more in preparation, and over 900 workers. It had service clubs in London and Paris which provided reading, lounging and sleeping rooms, and all such club comforts, while its huts behind the lines furnished centers of comfort, cheer, entertainment and small services of many sorts. It operated a great fleet of motor trucks which carried supplies up to the firing line and into the front trenches. Nothing was more welcome to the battle-weary soldiers relieved from front line duty than these "K. C." rolling canteens with their hot drinks, cigarettes and other comforts. The organization shipped to the other side and gave to soldiers and sailors many tons of supplies, including cigarettes by the hundreds of millions and huge amounts of chewing gum, soap, towels, stationery, candy and chocolate. It had more than a hundred voluntary chaplains on service with the troops, many of whom carried money furnished by the society to aid in providing comforts for the welfare of the soldiers.

The Salvation Army won a peculiar place in the hearts of our fighting men by the simple hominess and complete self-abnegation of its service. Its huts and hostels were in all the important training camps at home, while overseas the Salvation Army uniform

in some kind of a structure or dugout welcomed the army lad in the big camp areas, in the supporting lines and in the forward troop movements up to the rear of the front line forces and trenches. It had overseas more than 1200 officers, men and women, operating 500 huts of one sort or another, rest rooms and hostels. It had forty chaplains serving under Government appointment and it supplied nearly fifty ambulances. Its method was to put a husband and wife in charge of a canteen or hut, the man making himself useful in any way that offered, the woman making doughnuts and pies, chocolate and coffee for the ever hungry doughboys, and doing for them whatever small motherly service was possible. In their huts the men could always find warmth and light and good cheer, music and games and good things to eat that were touchingly reminiscent of boyhood and home. Shells screamed overhead, gas floated back from the front and the earth shook with the roar of battle, but the Salvation Army workers stood to their self-imposed duties regardless of their own comfort or danger and had ready for the long lines of soldiers coming and going a smiling, heartfelt welcome and huge quantities of pies and doughnuts and hot drinks. Its canteens were always open, day and night, and none of its workers was sent overseas without special training.

By far the largest, oldest and most important of these welfare organizations was the Young Men's Christian Association, which expended a total of nearly $80,000,000 on a system of war service so vast that the sun was rising upon it through every hour of the day. Within a few hours after the United States entered the war the Y. M. C. A. offered its

entire resources to the Government. At the end of hostilities it had overseas over 7,000 workers, of whom 1,600 were women; in the American Expeditionary Forces it had 1,900 war service centers, nearly 1,500 in the French armies, several hundred in Italy, with more in Russia and Siberia; in the United States it had 950 of these centers and 6,000 workers and it was represented in every cantonment and training camp for Army or Navy from end to end of the country. On this side, it paid for its huts and their equipment a total of more than $6,000,000, while overseas the similar expenditure went beyond $5,000,000, making a total of well over $11,000,000 invested in the equipment with which to give our soldiers and sailors rest and cheer, entertainment and comfort. The cost of the operation of these centers amounted, for the duration of the war, to over $6,550,000.

In the home camps and cantonments the "Y" centers had an average of nearly 20,000,000 visits from soldiers and sailors per month, while in them at the same time were written letters on free Red Triangle stationery numbering more than 14,000,000 and its entertainments, lectures and motion picture shows were attended by 5,000,000 men. It established and carried on thousands of educational classes, French being the most popular study. Its work was especially valuable in the education of illiterates and of foreigners who did not understand English. Some 50,000 who could not read or write when they entered the training camps received in this way the rudiments of a common school education. On troop trains and transports the "Y" workers were present, giving whatever service the conditions made possible.

Overseas the hut of the Red Triangle was to be found wherever there were American fighting men—in England, Ireland, Scotland, in France and Italy, Russia and Siberia, from Gibraltar to Vladivostok, from the Caucasus to the Murman coast. Sometimes the "hut" was a dugout, sometimes a ruined château, again it was a freight car on a siding, or a temporary shack, or a substantial building. But, whatever its form and appearance, it stood for home, for the democratic social fabric for which the men were fighting, and within it they could always find light and warmth, cheer and good fellowship, books, games, music, entertainment, smokes and toothsome dainties.

Motion picture films for the Y. M. C. A. to the average length of fifteen miles were shipped every week, and at its moving picture shows there was an average weekly attendance of 2,500,500. Scores of actors and actresses canceled their engagements and went overseas to interest and amuse the soldiers and sailors with performances of all kinds on the hut circuit, organized and directed by the Over-There Theater League, under the Y. M. C. A. During the latter months a hundred performances daily, on the average, were put on in the various camps. None of the players received a salary and shows of all kinds were free. There were concerts, lectures, readings, as well as movies and every kind of theatrical performance. A department of plays and costumes maintained in Paris sent out to the camps facilities for amateur performances and fifty professional coaches went from the United States to encourage and train the soldiers to produce entertainments of their own. Violins, banjos, mandolins, ukeleles and cornets were

sent over by the thousands, to say nothing of smaller instruments and sheets of music.

To provide for athletics and physical recreation for the soldiers and sailors overseas the Y. M. C. A. expended more than a million and a half dollars. It sent over 1,200 sports leaders and its shipments included huge quantities of baseballs and bats, boxing gloves, footballs, ping-pong balls, racquets, nets, tennis balls, running shoes, and all the paraphernalia of indoor and outdoor sports, to the value of $2,000,000, which were free for the asking.

The post canteens of the army were taken over by the Y. M. C. A., at the urgent request of the commander of the American forces and against its own desire, and operated throughout the war. This entailed the running of a huge merchandising proposition foreign to its customary activities and the work was assumed in addition to its chosen program of fostering the morale and cherishing the welfare of the fighting forces. For this post exchange service it furnished buildings and service without charge and sold to the soldiers at cost goods to the value of $3,000,000 per month. Its workers often carried packs of goods into the trenches and distributed them freely. Because it was all a question of service the organization itself bore the very considerable loss at which it operated the canteens.

A system of "leave-areas" conducted by the Y. M. C. A. provided recreation for the men on the seven days' furlough given to each one after four months of service. It was not thought desirable by the military authorities to turn the men loose for their holiday and therefore several resorts were taken over to furnish interesting places for them to

visit and were put into the hands of the Y. M. C. A. as hosts and entertainers. Aix-les-Bains was the first and twenty-five others were added until the men had a wide range of selection ranging from famed resorts in the Alps to others on the shores of the Mediterranean. It was a kind of entertainment that had to be created, for it was entirely without precedent. Largely in the hands of women workers in the Y. M. C. A., they and their men helpers and advisers bent their utmost endeavor, resourcefulness and loving care to the work of giving the men a good time and sending them back to their duties at the end of their leaves physically and mentally refreshed. Each area had its athletic field in which every day there were sports going on and there were mountain climbs, picnics, bicycle rides, and, in the evening, movies, theatrical entertainments, concerts, music and dancing.

The women's contingent of the Y. M. C. A. did effective work both in these leave areas and in the canteens. Their service was not enlisted until a year after our entrance into the conflict, but at the end of hostilities a thousand women were engaged in it, and so insistent was the call for them that they were recruited as rapidly as possible, a thousand more being sent over during the next three months. They were given a week or more of intensive training before sailing to fit them for the duties they would have to undertake.

Unique in all army as well as in all educational history was the great educational system which the Y. M. C. A. undertook to establish, under the authority and with the coöperation of the War Department. Beginning in the home camps, it was carried

across the sea, developed more and more as time went on, and found its climax in the "Khaki University." The final and complete plans were ready only in time for use with the Army of Occupation in Germany and in the camps abroad and at home in which the men waited for demobilization, when $2,000,000 worth of text-books had been ordered for the work. Some of the foremost educational experts of the United States, numbering several hundred, were engaged in the organizing and supervision of the system and many hundreds of others, members of the alumni and faculties of American educational institutions who were enrolled among the fighting forces, undertook the work of instruction. The scheme enabled soldiers and sailors to continue their studies without expense, whether they desired elementary, collegiate or professional instruction or agricultural, technical or commercial training. The scheme, which was finally taken over by the Army, is described at more length in the chapter on "The Welfare of the Soldiers."

So successful and important was the work of the Y. M. C. A. with the American forces that both the French and the Italian Governments requested it to establish service centers with their respective armies. This it did, the American workers who initiated and supervised the program of recreation and fostering of morale being assisted, in the respective armies, by French and Italians.

The prodigious program of the Y. M. C. A. with the American forces, which it has not been possible to more than outline, was carried through largely by volunteer workers who wished to undertake it as the best way in which they could help to win the war.

A Pleasant Evening in a Hostess House

Salvation Army Lassies at the Front

Men who were too old to fight or were physically unfit for military service joyfully welcomed the opportunity to do something that would aid the fighting men. Many gave up large salaries and left their situations for the sake of this important service. Others who were financially unable to leave dependents accepted for them an allowance much smaller than they could have earned themselves and gladly took up the work upon the mere payment of their expenses.

The "Y" workers were on the troop trains that carried the men from their homes to the training camps and the Red Triangle was at the fighting man's side from that moment until he was ready to go over the top. And sometimes the "Y" worker even went forward in the charge with the men for whose welfare he was giving his service. Shell fire not infrequently destroyed the trucks upon which the goods of the Y. M. C. A. were being carried to the front, its huts were sometimes shattered in the same way and nine of its workers, two of them women, were killed by bursting shells. Fifty-seven died in the service, most of them from wounds, over-work and exposure. Twenty-three were seriously injured or gassed. Of its workers 152 received official recognition for distinguished services, to thirteen of whom was awarded the Croix de Guerre and to fifty more other famous decorations.

The American Army was a reading and thinking army and that one of the seven great big-brothering organizations which undertook to supply it with reading matter, the American Library Association, was kept busy. The Library War Service of the Association had in each of forty-eight large army and

navy training camps and in seventy hospitals in the United States a central library building, or library quarters, with branches and stations radiating all over the camp or hospital area to render its volumes easy of access. It had collections of books in nearly two hundred hospitals and Red Cross Houses. It equipped with these collections over five hundred military camps and posts and aviation fields, schools and repair depots. It supplied with libraries 260 naval and marine stations and 750 vessels. It had nearly 2,000 branches and stations placed in Y. M. C. A. and K of C. huts, barracks and mess halls. It shipped overseas 2,000,000 books and 64,000 magazines and distributed 5,000,000 magazines donated by the public through the mails. In its war service libraries there were over 5,000,000 volumes. Three hundred and forty trained librarians supervised its service. Accepted books to the number of 4,000,000 were given by the American people, who provided also the money with which were bought 1,300,000 more. Book donations were well sifted before the books were accepted for war service and the authorities of the association estimated that probably twice as many were given as were finally used.

But even these enormous quantities of books and magazines were no more than sufficient to meet the desire for reading shown throughout the Army and the Navy. The Library War Service of the Association did its best to supply to every fighting man in the training camps at home, on the transports, on the cruisers and battleships, in the stations overseas, in the camps and rest billets, the book he needed when he wanted it, whether it was light fiction, or a technical treatise, or a work of history, economics,

philosophy or travel. It supplied books in practically all the modern languages—about forty were represented in each of the large camps—for both study and reading and its lists were filled with titles of scientific, technical and other works that covered the whole range of modern knowledge and activity, philosophy, literature, history, biography, poetry, art, music, fiction, drama, economics, sociology, business, travel. There was demand for them all. Toward the end of the war and after the armistice the Library War Service bent its energies to meeting the greatly increased call for vocational books that would enable the fighting man to become more efficient in his special job or to get a better one when he should presently be returned to civil life.

To support this vast enterprise of big-brothering the Army the American people gave without stint to the organizations by which the work was systematized and carried through. They gave money and effort and thought and love, because it was for "our boys." They responded with more than was asked by each organization in its separate appeals made during the first year and a half of our war effort. Then, in order that the appeal for funds might be made more efficiently and economically, the seven chief organizations united in a great, nation-wide drive, the money that was subscribed to be divided proportionately among them. They asked for $170,000,000. All the preparations had been made for it before the armistice was signed and it began on that day. Every one believed that the war was over, but because "our boys" were still overseas and for many weeks to come would need care, recreation, comforts

and entertainment, no hand withheld its gift. When the week's drive was over it was found that $203,179,000 had been subscribed to continue the work of big-brothering the fighting forces.

CHAPTER XXXII

RUNNING THE RAILROADS

DURING the first nine months of our participation in the war the railroads did their best to meet the unusual and mounting demands upon their facilities and methods. But the entire railroad system had developed under the principle of competition and, composed as it was of so many diverse parts and divergent interests, all accustomed by theory, tradition and practice to competitive methods, it presently became evident that the coördinated management and coöperative effort demanded by the emergency would be impossible under continued private control. The immense increase in traffic caused by war conditions had strained the existing system to its utmost effort, and had resulted by the autumn of 1917 in hopeless congestion of freight at eastern terminals and along the railway lines far inland. There had been such rapid increase in operating expenses that the financial situation of the railroads was very bad, and, under the general financial conditions of the time, had become a serious menace. The country was at war and its first and most pressing duty was to prosecute that war to early and complete victory, which it could not do under the paralysis that was threatening the transportation system.

For the Government to take control of the rail-

roads was an almost revolutionary procedure, so opposed was it to American economic theory, conviction and practice. But the problem was rapidly being reduced to the bare alternatives of governmental railroad control or the losing of the war, or, at least, its long-drawn out continuance. But one solution was possible, and, disregarding all theory and all deeply rooted custom, the President, in accordance with powers already conferred upon him by Congress, took possession and assumed control of the entire railroad system of the United States at the end of December, 1917.

Management of transportation by rail and water was thereupon put into the hands of a Director General of Railroads, who thus found himself at the head of more than 265,000 miles of railway, many times the mileage of any other nation, and of 2,300,000 employees. There were about 180 separate operating companies having operating revenues of $1,000,000 or more per year each and several hundred more with less than that yearly revenue. The Railroad Administration, which decentralized its work by dividing the country into districts, each under a regional director, began its task in the face of weather conditions without parallel in the history of the country, which had already almost paralyzed transportation and were to continue for ten weeks longer.

There was a shortage of freight cars and of locomotives and the railroads, in common with all the country, were menaced with a shortage of coal, due mainly to the immensely increased demand and the breakdown of transportation. So great was the congestion of freight that in the area north of the Po-

tomac and Ohio Rivers and east of Chicago and the Mississippi there were 62,000 carloads waiting to be sent to their destination, while along the lines west and south of that area there were over 85,000 more carloads held back by this congestion. Nearly all of it was destined for the eastern seaboard north of Baltimore.

In addition to the usual transportation business of the country, hundreds of thousands, mounting into the millions, of soldiers had to be carried from their homes to cantonments and from cantonments to ports of debarkation and billions of tons of munitions, food, supplies and materials of many kinds had to be carried from all parts of the country upon lines that converged toward eastern ports, while the immense war building program of the nation—cantonments, camps, munition plants, shipyards and ships, warehouses, structures of many sorts—called for the transportation of vast quantities of material.

By the first of the following May practically all of this congestion had been cleared up and through the rest of the year there was no more transportation stringency, although traffic grew constantly heavier until the end of hostilities. It will illumine the conditions under which the Railroad Administration achieved its results to mention a few of its items of transportation. During the ten months ending with October it handled 740,000 more cars of bituminous coal than had been loaded during the same period of the previous year. From the Pacific Northwest there were brought, from April to November, for the building of airplanes, ships and other governmental activities and for shipment overseas, 150,000 cars of lumber. During the year 630,000 cars of grain were car-

ried to their destination, the increase from July to November over the previous year being 135,000 cars. Livestock movement was especially heavy, showing in all kinds a large increase. Five hundred and sixty thousand carloads of material were moved to encampments, shipyards and other Government projects. From the middle of May to the end of the year the car-record office showed a total movement of 1,026,000 cars, an average of 5,700 daily.

Comparison of the physical performance of the roads during the first ten months of 1918 with that of the similar period in 1917, reduced to fundamentals, showed an increase in the number of ton-miles per mile of road per day, in number of tons per loaded car, in number of tons per freight train mile, in total ton-miles per freight locomotive per day. The constant purpose was to keep each locomotive and car employed to its capacity and to make each produce the maximum of ton-miles with the minimum of train, locomotive and car miles.

Highly important among the achievements of the Railroad Administration was the movement of troops. From the first of the year until November 10th there were transported over the roads 6,496,000 troops, an average of 625,000 per month, the troop movements requiring 193,000 cars of all types, with an average of twelve cars to the train. Outstanding features of the troop movement were that 1,785,000 men were picked up from 4,500 separate points and moved on schedule to their training camps, that 1,900,000 were brought into the crowded port terminals for embarkation without interference with the heavy traffic of other kinds already being handled there and in the adjacent territory, that 4,038,000

were carried an average distance of 855 miles, undoubtedly the largest long distance troop movement ever made. During one period of thirty days over twenty troop trains were brought each day into the port of New York. During the entire period from January to November including these huge troop movements there were but fourteen train accidents involving death or injury to the men.

To all the necessities of the wartime effort of the railroads—the enormously increased quantities of freight that had to be moved expeditiously and the transportation of troops—was added a considerable increase in the ordinary passenger traffic. Notwithstanding the earnest and repeated requests of the Railroad Administration that only necessary journeys should be taken by civilians, a request that was, indeed, very generally heeded, and the increase in passenger rates, the passenger traffic all over the country was much heavier than in any previous year, the increase amounting in the region east of Chicago to twenty-five per cent.

The efficient handling of all this enormous freight and passenger traffic was made possible by the policies that were adopted. The handling of the whole vast network of railroads as one system eliminated competition and the wasteful use of time, effort and equipment. The previous usage of the roads in accepting freight at the convenience of the consignor without regard to the ability of the consignee to receive it had resulted in the appalling congestion of terminals and lines in the autumn of 1917. The Railroad Administration based its policy upon the principle that the consignee must be considered first and that if he could not receive the freight it was worse

than useless to fill up switches and yards with loaded cars. In order thus to control traffic at its source a permit system was adopted which prevented the loading of traffic unless there was assurance that it could be disposed of at its destination. This policy proved to be the chief factor in the ability of the transportation system to meet the enormous demands upon it.

Modification of demurrage rules and regulations induced more rapid unloading of cars and their quicker return to active use. Consolidation of terminals, both freight and passenger, greatly facilitated the handling of cars. Locomotives that could be spared were transferred from all parts of the country to the congested eastern region. Coördination of shop work increased the amount of repairs upon equipment that could be done and kept locomotives and cars in better condition while new ones were ordered and work upon them speeded. Rolling stock and motive power were economized by doing away with circuitous routing of freight and sending it instead by routes as short and direct as possible, a policy which saved almost 17,000,000 car miles in the Eastern and Northeastern Region.

A plan was devised for making up solid trains of live stock and of perishable freight and also consolidated trains of export freight at Western points and forwarding them on certain days of the week directly and rapidly to their destinations. Passenger trains that had been mainly competitive and such others as could be spared were dropped, resulting in the elimination during the first seven months of Federal control of 47,000,000 passenger train miles—an economy in motive power and equipment without which

the successful movement of troops would have been impossible. Equipment was standardized, making possible its universal use, and freight cars were more heavily loaded. In place of the separate ticket offices made necessary by private and competitive ownership consolidated ticket offices were opened in all large cities, 101 of these doing the work of the former 564. The result aimed at was both economy and a better distribution of the passenger traffic.

The Railroad Administration saw in the inland and coastal waterways and the coastwise shipping service an important possible aid in its task of making transportation equal to wartime needs, and so mid-Western rivers and Eastern canals were brought into coöperation with railway service and several coast-wise lines of steamships were made a part of its facilities.

The rental, or return, guaranteed to the railroad companies amounted for the year approximately to $950,000,000. Upon the advice of a commission appointed to investigate the matter of wages and living costs among railroad employees, wages were raised and threatened labor trouble thereby averted, the increase amounting to between $600,000,000 and $700,000,000 for the year. In the ten months ending November 1st the railroad receipts from freight, passenger and other sources aggregated over $4,000,000,000 and were almost as large as for the whole of the previous year. The receipts were greater by 20 per cent, but operating expenses also had increased by more than $1,000,000,000, the year 1918 breaking all records for both revenues and expenses. The increase in wages, in cost of coal, and in all maintenance and operating costs was responsible for

the increase of expenses, which would have been much greater but for the economies introduced. Freight rates were raised during the year to help meet the raise of wages, while a substantial increase in passenger rates was put in force both to help in that result and to discourage unnecessary passenger traffic during wartime conditions. There was a final balance against the Government, as between the net income of the roads and the guaranteed return to their owners, of between $150,000,000 and $200,000,000.

The sole purpose of the Government in taking over control of the railroads was to achieve a more efficient prosecution of the war by more rapidly forwarding our own war effort and by giving more effective coöperation to our war associates. Thus, early in the winter of 1918 the Western Allies made it known to the United States Government that unless the food promised by the Food Administration could be delivered to them very soon they could not continue their war effort. This was immediately after the Railroad Administration had taken charge of the railroads and was struggling with the freight congestion extending through the eastern half of the country, with coal shortage and blizzard weather Every possible facility of the Railroad Administration and of the roads it was operating was brought to the emergency, and railroad officials and employees worked day and night, with the results that by the middle of March all the available vessels of the Allies had been filled with food and dispatched across the Atlantic, while at Eastern seaports were 6,000 more carloads ready for later shipment.

In carrying out this war-furthering purpose the

Railroad Administration coöperated constantly with the other war administrative and war prosecuting agencies of the Government, the Food and Fuel Administrations, the War Trade and War Industries Boards, the Shipping Board, the Army and Navy Departments. Just as food, fuel, trade, industry, labor were each and all mobilized for war effort and all brought into harmonious and effective teamwork, so the transportation agencies were all bent, first of all, to the same purpose. Roads, motive power, freight and passenger equipment were devoted first to the necessities of carrying men from homes to cantonments and camps and thence to ports of embarkation and of moving food, munitions, supplies and raw materials to camps, to shipment points and to places of manufacture for war purposes. After these war needs were met whatever remained of transportation facilities was at the disposal of the ordinary commercial traffic of the country.

In order that the public might better understand the situation and in order also to better the service of the roads there was instituted a Bureau of Complaints and Suggestions which dealt with all dissatisfactions and considered suggested improvements. A very large number of the railroad employees of all kinds, efficient through years of service, joined the fighting forces of the nation or engaged in work more directly concerned with the war and so made it necessary to fill their places with untrained help. To remedy this condition training schools were established with successful results.

In the summer of 1918 all express companies were combined and placed under the management of the Railroad Administration and a little later telegraph

and telephone companies, because of their refusal to accept an award of the War Labor Board, were unified and placed under the control of the Postmaster General, as, in the autumn, was done also with the cable companies.

CHAPTER X

THE WORK OF WOMEN I

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been detached from woman's usual environment. But they were none the less essential.

The shutting down or curtailment of non-essential industries and the rapid expansion of those directly or indirectly engaged in war production shifted many women already possessing some degree of industrial training into war work plants of one sort or another, while the need for workers and the desire to give service of direct consequence led many women to enter factories who had not before undertaken industrial work. Among the latter class were many of collegiate education, or of independent means, or engaged in office work who were moved by patriotism to undertake factory work for the war. The flow of women into war industrial work increased steadily throughout the year and a half of our participation and would have been very greatly augmented if the war had continued long enough to call the men of the second draft from their situations.

By the end of September, 1918, women were working in munition plants of many kinds, making shells, grenade belts, fuses, gas masks, metal parts of rifles, revolvers and machine guns, and many other sorts of the direct supplies of war. Accurate statistics of their numbers made in the early summer of 1918 showed that about 1,500,000 women were engaged in the industrial work directly or indirectly connected with the Government's war program, while subsequent estimates added about 500,000 to that number to cover those entering such work down to the signing of the armistice.

The former report, covering the conditions at the end of our first year of war, showed 100,000 women working in private munition plants and Government

WOMAN'S LAND ARMY MEMBERS SORTING AND GRADING POTATOES

By Permission of Woman's Land Army

TRAINING CAMP OF WOMAN'S LAND ARMY

for the prosecution of the war, such as work in airplane factories, in chemical plants, in those making electrical appliances and in metal trades making bolts, screws and other small parts necessary for the building of many war essentials. More than 600,000 women were engaged in the manufacture of things necessary for the soldier's equipment and 800,000 more in industries necessary to feed and clothe him. All these numbers were greatly augmented during the seven following months until the close of the war.

Training classes and entering schools were established in scores of plants for the training of unskilled women workers. Practically all the employers of women bore testimony to the efficiency with which they worked. In order to protect their welfare the United States Department of Labor organized a Woman in Industry Service which, by means of a council of representatives from all the Federal agencies for the prosecution of the war in which women were employed, established standards and policies for the controlling of wages and industrial conditions in plants employing women.

More than 100,000 women entered the service of the Railroad Administration, where they undertook capably many forms of unskilled labor and held many varieties of positions requiring knowledge and experience, from bookkeeping to office superintendency, while many thousands more filled places left vacant by men on surface, elevated and subway car lines.

It is impossible even to estimate the number of women who engaged in the production of food for the purpose of aiding the war. They cultivated war

young women of social station, because of the lack of the usual labor, helped to gather cotton and other crops; in the Northwest women volunteered their help in the harvesting season and in some localities they formed half or more of the workers who shocked the grain in the fields; in other regions they picked berries and gathered fruit; they went from cities and towns to country districts to help the farmers' wives; they took an active part, individually and through clubs, in the increase of poultry, hog and dairy production; in state after state they registered for farm work; and they organized the Woman's Land Army which gave much and efficient aid in many parts of the country.

The Woman's Land Army of America, numbering 15,000 members, was composed of women who had previously done little or no farm work and who enlisted in it primarily for the sake of doing something of consequence to help win the war. It was organized in seventeen states, the state organizations uniting under the national organization and each one forming and training its own farm units. In one state, New York, there were forty of these land units, each established at a camp under a woman supervisor. They lived at the camp, boarding themselves, and were carried in their own auto-truck to and fro between the camp and the farms where they worked by the eight hour day. They were carefully selected from volunteers for the work on the basis of physical qualification and probable morale and among their numbers were represented teachers, college girls, art students, telephone operators, stenographers, women of leisure. They planted, plowed and hoed, aided in

the harvesting, drove horses and tractors, gathered fruit, did dairy work, cared for poultry and stock and proved themselves equal to all the usual work of truck, dairy and general farming. There were, altogether, one hundred and twenty-seven units, ranging from twenty to one hundred and fifty members each. Farmers who employed them found them capable and efficient and their labor proved to be a welcome factor in solving the problem of increasing farm production when farm help had been seriously depleted by the draft and the munition factories. So successful was the Woman's Land Army during the first year of its existence that in the autumn of 1918 an enthusiastic campaign was started for increasing its numbers the following year and plans were laid for courses of training during the winter.

In the conservation of food women everywhere cooperated with the Government in many ways. They enthusiastically supported the requests of the Food Administration, their organizations sent out food experts, dieticians, conservation instructors through country districts, into villages and towns and among the women of the poorer quarters in cities to give free instruction in the economical but efficient use of foods and in the best ways of canning, preserving and dehydrating fruits and vegetables.

In the financing of the war the women of the country gave noteworthy help. The National Woman's Liberty Loan Committee was organized by the Secretary of the Treasury in May, 1917, as an independent bureau of the Treasury Department, the first and thus far the only executive committee of women in the Government of the United States. It was created too late to give much assistance in the

first Liberty Loan, but it was active in all the succeeding ones and was thoroughly organized all over the country, for the greater part by states, with county organizations under the state or the district. It had 3,200 county chairmen and under these, reaching out into every community, 49,500 associate chairmen, while 800,000 women were engaged in its work. They organized meetings, engaged speakers and secured booths and workers for the sale of bonds, but the greater part of the work of the organization was done by canvassing from house to house.

This they did in cities, towns, villages, country districts, on foot, on horse-back, by carriage. They did not stop for rain, or sun, or wind, for dust, or mud. If it was planting time and all the horses of the farm were in use, the chairman of a rural committee walked miles upon miles to cover her territory. In two or three counties of the southern mountain region famous for their bloody feuds women rode on horseback up and down the mountain sides day after day canvassing for the Liberty Loans and carrying the counties over the top triumphantly with subscriptions above their quotas early in the course of each campaign. In these counties so many men had enlisted in the army before the draft went into effect that the burden of taking care of the loans fell to women.

In state after state the Woman's Committee raised from one-third to one-half the quotas of the entire state and in the three Liberty Loans in which it worked it sold $3,500,000,000 worth of bonds. It was equally active in the campaigns for the sale of War Savings Stamps and its aid proved so important that

in several of the Federal Reserve Districts it was asked to take over the entire work.

The importance of the aid American women gave to the Red Cross was beyond computation and was so varied in kind and enormous in quantity that anything more than the merest outline of it is impossible. Volunteer women workers, nearly all of them doing the work at odd moments in addition to their home or other duties, knitted and sewed so busily that they made nearly 300,000,000 articles, valued at $60,000,000, for the Red Cross, to be used in training camps, by our fighting forces, in hospitals at home and abroad and by the refugees and sufferers in the war ridden countries of Europe.

Many thousands of women worked in canteens, poured coffee, tea and chocolate and carried baskets of cakes and cigarettes for the refreshment of soldiers as their troop trains stopped at stations on their way to and from cantonments or poured into and out of ports of embarkation. More than a million and a half of the soldiers of America as they boarded their transports had their last touch of home at the hands of Red Cross women who, no matter what the hour of day or night, were ready at the piers with buns and cigarettes and cans of steaming hot drinks.

Many other thousands enlisted for the Red Cross Home Defense work and in its offices or as home visitors gave advice, aid, comfort to the families of soldiers and sailors, helped them to meet their problems, material, financial, spiritual, and procured for them, when necessary, professional advice and assistance, thus aiding morale at the front by upholding that of the family at home. Other thousands of women wearing the Red Cross insignia worked in the hospitals

overseas and in convalescent homes on both sides of the ocean. No less than 8,000,000 women, and probably more, were actively working for the Red Cross throughout the war, organizing, directing and aiding the work of its chapters and making hospital bandages, sweaters and other knitted articles, clothing for refugees, and repairing soldiers' garments.

More than 16,000 trained nurses enlisted in war service and worked in hospitals at home and overseas and 10,000 more had enrolled for service at the end of hostilities. The organization of the American Women's Hospitals of the Red Cross recruited, organized and sent to France several units, each consisting of ten women physicians and as many aids, with the necessary hospital equipment.

Several hundred women entered the navy as yeomen and gave capable and efficient service. Others joined the Signal Corps of the army, 233 of these going to France, where their work as telephone and telegraph operators received high praise from army officers.

In work for the welfare of the fighting forces the women of every part of the country took a very prominent part. The War Camp Community Service, described in "Big-Brothering the Fighting Forces," was carried on largely by their efforts. Organizations of women of many kinds drew together women of similar occupations for welfare work or brought together those of the greatest variety for the same ends. The Stage Women's War Relief, composed of actresses, made and sent abroad or to hospitals at home great quantities of comfort kits, knitted articles, bandages, hospital supplies, dainties to tempt the appetite of convalescents, clothing for refugees,

cigarettes and tobacco. The members of the Young Women's Christian Association were to be found in active work for the war in nearly all the camps and cantonments of the United States, and also in France, and even in the frozen north of Russia, where in several cities their Hostess Houses and canteens offered cheer and comfort to soldiers and sailors.

The Association established a War Work Council which devised and carried out methods by which it could aid in the prosecution of the war. Its Hostess Houses in camps and cantonments were links between the men in training and the life they had put behind them, where their relatives and friends could meet them in pleasant surroundings. The type of the Hostess House was created for the Y. W. C. A. by a women architect at the beginning of the war and was planned for the special needs which the Association foresaw. It combined the features of restaurant, reading and lounging rooms, and sleeping rooms for relatives who might have to stay overnight in the camp, while its semblance was that of a pleasant country club. The Hostess Houses were the scenes of many war weddings, of occasional christenings, of first meetings between returning happy soldier or sailor fathers and their children born in their absence, and they were sometimes a welcome refuge for mother or wife, sister or sweetheart, summoned to the camp by the fatal illness of a loved one.

The Association had a total of almost one hundred and fifty Hostess Houses in this country, in the camps and cantonments for both white and colored troops, in which were over four hundred workers. In France it carried on fifteen of these or similar houses for American women directly engaged in war work, such

as those in the Signal Corps, and for women connected with the British auxiliary organizations, twenty-one for nurses in base hospitals and eighteen for French women working in munition factories, offices, stores and for the American army. The Y. W. C. A. gave much assistance also in the providing of emergency housing for women engaged in work for the war in this country, while its endeavors for the improving of morale and the inculcating of American ideals among foreign born and colored women and girls aided in rousing their patriotic spirit. It operated War Service Industrial Clubs with cafeterias and recreation halls and a variety of entertainments and classes for study in centers of war industry where women were employed.

A Woman's Division was instituted by the Young Men's Christian Association at the end of our first war year and during the next seven months its work grew to important proportions. Carefully chosen for the service, the women were given just before they sailed a week of intensive training for their duties on the other side. Instruction in hygiene taught them how to keep themselves fit under conditions that would call for all their strength; their knowledge of French was freshened; they had lectures on the kind of cooking needed for canteen work and talks on the geography, history, customs and characteristics of France, in order to give them a degree of sympathetic understanding of the people among whom they would have to work; they were encouraged to practice any sort of special facility for the entertainment of groups of men which they might possess; and they were expected to be accomplished dancers before they were enlisted. On the other

side they worked in canteens and were especially useful in the recreation centers described in "Big-Brothering the Fighting Forces," of which twenty-six were organized in different parts of France. In these recreation camps, or "leave areas," in the "Y" centers in Paris and other French cities, in canteens in camps and behind the front lines, the Red Triangle women made and poured coffee and chocolate and tea, distributed candy, cakes, gum, cigarettes and tobacco, provided Christmas boxes, sang, danced, recited, played games and did whatever the moment demanded for the welfare and the entertainment of the American fighting men. The women practically created the service of the "leave areas," which was something entirely new in warfare. They went with the canteens to the front lines, advanced with the Army of Occupation through Luxemburg and Alsace, and settled down with it in Germany. They worked also with the American forces in England and Scotland, Russia and Italy. After the armistice, when many of the men secretaries of the Y. M. C. A. began to return to their neglected business in the United States, the women took over more and more of the canteen and other work. When hostilities ended, a thousand women were engaged in Red Triangle work overseas and so important was their service that in response to the call for them that number was doubled during the next three months, and the Association was then still recruiting, training and sending them to France.

Three organizations enlisted women as automobile drivers for war service,—the Motor and Ambulance Corps of the American Red Cross, the Motor Corps of America and the Motor Corps of the National

an estimated membership of several thousand women, most of whom were women of leisure who owned their own cars and were glad to give for the country's needs their own time and work and the service of their automobiles. Before being received in either of the organizations they had to undergo a course of intensive training averaging six weeks and including revolver shooting, first aid treatment, surgery clinics as a test and training for the nerves, clinics for the handling of the insane because mentally unbalanced soldiers had to be transferred by ambulance from transport to hospital, military drill twice a week and a course in mechanics. A member of a woman's motor corps had to know how her car was built and be able to take it apart, if necessary, and put it together again and if it balked to discover what was the matter and apply the needed remedy. The Motor Corps women served both at home and overseas and they drove trucks, ambulances and cars. Their service was ready for any war organization that needed them, their vehicles plied between transports and hospitals, carried convalescent soldiers out for an airing, were on duty at cantonments and camps and answered many similar calls. Their rules demanded at least nine hours per day on duty, but actual service often stretched to fifteen or twenty hours out of the twenty-four.

The National League for Woman's Service, by which one of these corps was recruited and directed, was organized for patriotic purposes two months before America entered the war and upon that event was ready to begin active work in the coördinating of women's organizations and the enlisting and di-

recting of all manner of women's resources and abilities that would aid the nation in the prosecution of the war. Its organization spread into almost every state of the Union and numbered 300,000 members. Its Motor Corps Service, which was recognized by the Surgeon General of the Army, had throughout the country seventy-eight chapters with a membership of about five hundred women car owners. Its social and welfare division established many soldiers' and sailors' club rooms and club houses, with reading and lounging rooms, billiard and pool tables, dances and entertainments, and classes in French and English. It also conducted classes for the instruction of women in occupational therapy and handicraft who worked in hospitals and camps, recruited and trained women to serve as nurses' aids, and coöperated with the War Camp Community Service in many ways. Its members worked in canteens and clubs, gave their services in workrooms where clothing and supplies were made for hospitals and for soldiers and sailors, distributed the thousands upon thousands of flower donations made to hospitals by florists, worked with the Food Administration by distributing food pledges, establishing emergency and community kitchens and providing experts in home economics who gave instruction in food conservation. The League collected books, magazines, games and tobacco for the fighting forces, recruited a Woman's Reserve Camouflage Corps which gave some important services, enlisted the aid of authors and artists for the publicity needs of one or another department of the Government, and served, in general, as a means of mustering and directing the resources and abilities of women for war work.

had their war service committees, or mobilized all their members for that purpose, and these were closely linked together through their federations so that their work, which included assistance for every war making and war assisting agency of Government or people, could be done without overlapping or waste. Women's colleges and women students in co-educational institutions also took up war work, as described in "Feeding the Nations." As the men students of the colleges mobilized for training for the war in the Students' Army Training Corps, the women students mobilized for work to uphold the war. The Association of Collegiate Alumnæ, with membership spread all through the Union, organized itself for war effort with especial reference to the task of bringing home to people everywhere the fundamental issues involved in the war, the necessity of fighting it through to a completely victorious conclusion and the dangers that would lurk in a premature peace. The Association coöperated with the Committee on Public Information, held college women's rallies, formed local speakers' bureaus, helped to procure trained workers for various forms of national service, set on foot a movement to provide in colleges preparatory nursing courses for women, and worked with and for all of the war sustaining agencies of the Government.

Coöperating with all these and with the many other women's organizations for war effort and comprehending in its nation-wide scope all the women of the country was the Woman's Committee of the Council of National Defense, which interlocked in effective team-work all organizations of women and, reaching out to almost every community in the land,

inspired those outside such organizations to definite, regular, organized effort for war service especially fitted for women's hands. It served solely among women, just as the Council of National Defense, of which it was a part, joined in team-work all war sustaining and war producing agencies and organized the communities, as told in "Organizing the Nation."

The Woman's Committee was created in April, 1917, and very soon had its divisions organized in each of the forty-eight states and also in Alaska, Hawaii, Porto Rico and the District of Columbia. Upon each State Committee were represented both the state-wide women's organizations and the women not connected with any organization, and these committees organized the states into small units. Over 15,000 of these subordinate units had been formed and were at work by mid-summer of 1918, including 2,500 counties and 8,500 cities, towns and townships and, in addition, many thousand smaller units, such as school districts, wards, precincts, city blocks. These small units brought the organization into direct touch with women everywhere and enlisted them as individuals and as groups in the great army of patriotic women who were giving everything in their power for the prosecution of the war.

In half or more of the states women registered for war work, stating the amount of time they could give, the special service for which they were fitted and the kinds of work they could do. When the request came for volunteers for any particular service, or when it became known that there was some new need for woman's assistance, the leader of each unit knew just where to look for the necessary help. The

Woman's Committee, from its central offices in Washington to the members of local units in city block or country district, worked with the Food Administration for the increased production and the conservation of food and, similarly, gave their help to the conservation program of the Fuel Administration. So also, they coöperated with the War Camp Community Service and the Training Camp Commissions, with the Liberty Loan and War Savings Stamps campaigns, aided in the campaign to recruit nurses and in that to secure workers for the ship yards, and helped to find trained women workers who were needed at once by the rapidly expanding departments and the new boards and commissions at Washington.

The Woman's Committee endeavored always, while aiding in the work of the war agencies, to preserve and improve the peace time standards and values of life. And therefore not a little of its work was along the lines of maintaining the health and protecting the welfare of women and children. It had a department of Child Welfare and carried on a vigorous campaign to further these aims while it endeavored to promote public sentiment in favor of proper living and working conditions for women in industry.

The Woman's Committee of the Council of National Defense, in short, mobilized in one great, enthusiastic, democratic army the women of all the land, rich and poor, ignorant and cultured, of many races, of foreign birth and of American ancestry, and by organization enabled them to use their time, ability and effort in the way and at the time when they would be of best service.

CHAPTER XXXIV

FIGHTING THE UNDERGROUND ENEMY

FOR years before it plunged the world into war the German Government, as in every country in which it could obtain the necessary foothold, had been applying in the United States its policy of "peaceful penetration." Toward that end it had endeavored by many apparently innocent means to hold the loyalty of American citizens or residents of German birth or extraction, to create a dominant body of sentiment in favor of anything and everything German, and to secure the open or concealed control of vast quantities of business through which it could operate for the furtherance of German interests, political, industrial, financial or cultural. German methods and ideals accepted in schools and colleges; German departments in universities that were centers of influence for the spreading of admiration of everything German; in some regions Germanized public schools; a country-wide net-work of German societies and associations through which love and loyalty for the "fatherland" were kept alive; millions of dollars of German money invested in American business, frequently under disguised ownership; German and Austro-Hungarian diplomats using their offices and privileges for the promotion of all manner of intrigue against the interests of the

country; plots for the control of industry, the destruction of property, the inciting of sedition, the hatching of conspiracies, the rousing of enmity against us in friendly nations—these were some of the things the American people found had been going on under their very noses, many of which they had thoughtlessly aided, when the shock of war opened their eyes to the character and the methods of the enemy who, for the sake of civilization, had to be rendered innocuous. It was an enemy who had not only to be fought on the open battlefield but foiled in all the underground tricks and activities in which he was exceptionally expert and incessantly busy.

Before our entrance into the war Germany had used her own and the Austro-Hungarian embassies and her well organized spy system to carry on operations against England and France, her diplomatic representatives and her agents secretly concocting and directing activities that would interfere with the efficiency of the Entente Allies and might also be depended upon to create friction and possibly even war between them and the United States. After the two ambassadors and their staffs had been sent home because of these machinations and the United States had declared war, there still remained the spy system, which had been greatly increased and strengthened during the first years of the war. Huge sums of money financed it and it was directed and carried on by some of the most experienced agents of the German Foreign Office. To aid them Germany had sent to this country many professional men, scientists and others with instructions to advance German interests and to assist in the carrying on of her

underground activities in every possible way. The Intelligence Division of the United States War Department estimated that Germany maintained in this country, before and after our entrance into the war, an immense, secretly operating force of between 200,000 and 300,000 paid and volunteer workers. There was also the wide-spreading net-work of business firms, apparently innocent, but really a cover and medium for enemy machinations.

Emissaries to blow up bridges and railroads and do other damage were sent into Canada. Malcontents from Ireland and India were sought out and financed and aided in the laying of plots to create dissatisfaction, riots and, if possible, revolution in their home countries. A French traitor was brought to the United States and furnished with money for setting on foot a traitorous scheme in France. Much ingenuity was expanded in the endeavor to create friction between this country and Japan. In Mexico Germany diligently spread propaganda to influence the people and government of that country against the United States and aided and financed terroristic movements and activities whose purpose was to embroil the two nations in war.

Germany's underground activities in the United States, some of them dating before our entrance into the war, some of them carried into the period of our war participation, and others not begun until after we became a belligerent, included many and varied schemes to prevent this country from exercising its rights under international law, to interfere with its effective prosecution of the war and to undermine its political and trade relations with other countries. An effort was made to gain control of airplane build-

upon the munitions industry, by maneuvering it into the hands of German capital so camouflaged that its character would not be recognized. A particularly well organized and cunningly concealed scheme, directed and financed in the United States, was set on foot to buy up and hoard wool and woolen and other textiles, in both North and South America, needed for the clothing of our own and our associates' armies.

Plots were laid and feverishly pushed forward for blowing up ships bearing troops or war cargoes across the Atlantic and for wrecking munition plants and other war industries. German agents sent throughout the Southern states did their best to incite race riots among the negroes and to instigate a race war, working among them in their homes and churches and following them into cotton fields and mills and even into the army camps. Much effort and ingenuity were expended in the attempt to cause dissatisfaction and strikes among the workers in war industries and strife among those of different nationalities.

Propaganda, both open and concealed, was carried on by innumerable methods in the hope of influencing sentiment against the war, in favor of Germany, or against our war associates. For this purpose there were used moving pictures, the pastors of German churches, the German language press, the newspapers of other languages, writers in German pay who contributed articles and correspondence to American newspapers and magazines, German owned or controlled periodicals whose directing influence was well concealed, and a great number of societies

having for their ostensible purpose the aiding of the aims of labor, or of pacifist sentiment, or of socialism.

The United States Department of Justice discovered, in the course of its investigations, that the German Government had placed in this country for the use of these various underground activities over $27,000,000, of which $7,500,000 had been spent in propaganda.

For measuring forces with an enemy of this sort the United States, when it entered the war, was inadequately equipped with laws. A friendly people, believing in square and open dealing between nations as between individuals and trusting those to whom it had given citizenship and business and professional hospitality, as it would expect to be trusted in another land, had never thought it necessary to enact such laws as this emergency demanded. The only weapon of consequence which the Government had ready for conflict with the underground enemy was a statute which had been in force more than a hundred years permitting the arrest and internment by executive order of an alien enemy believed to be a menace to the public safety. Advantage was taken of this at once and some of the most dangerous agents of Germany were soon under guard and innocuous for the duration of the war. This internment statute was a powerful weapon in putting down enemy activities, while the severity with which it was enforced from the very beginning was effective in discouraging the continued hatching of plots.

An espionage law enacted two months after our declaration of war and strengthened later on and a sabotage bill dealing with injury to property gave

the needed means for dealing with a difficulty the nation had never before encountered. The espionage act was effective against organized or deliberate enemy or disloyal propaganda, but it was not intended to curtail the rights of free speech or of a free press and in its enforcement the courts made every effort to protect these rights as the basis of our political institutions. In the emotional tensity of the time it was inevitable that there should be bitter charges of excessive leniency on one side and, on the other, of unnecessary severity from those who feared the undermining of our principles of freedom. But in the end there were few who did not recognize that substantial justice had been meted out in most of the many cases. German alien enemies were required to register and 480,000 men and women were thus listed. A system of permits governed their movements and debarred them, without special permission, from the District of Columbia and from specified zones surrounding fortifications, docks, piers, wharves, warehouses, and other places important for war purposes. They were forbidden also to enter or leave the United States.

Much more lenient treatment was given to the subjects of Austro-Hungary, upon whom the only restriction was that of not leaving the country, although they were also subject to arrest and internment if guilty of dangerous activities. They proved to be worthy of the trust placed in them, for, although there were seven or eight times as many of these enemy aliens as of those of German citizenship, they gave little trouble of any sort, their labor helped importantly in much of our war production and

throughout the war they were quiet, industrious and law-abiding.

Germany's spies and agents were of several nationalities and in order to keep an effective watch upon their movements a stringent passport system was instituted which made impossible the departure from this country of any one whose purpose was not clear and proper. Private persons were forbidden to carry mail out of or into the country, as a means of preventing enemy agents from sending reports by others. Officers and crews of neutral ships were not allowed to land at United States ports without permits from the Department of State. A large force of picked and trained men, numbering several hundreds, scrutinized every ship coming into or going out of the important ports, her cargo and her passengers, to make sure that no enemy agent was among them or material of any sort intended for the enemy secreted in hold, or quarters, or cabins.

Supplementing the six secret service agencies of the Government, all of which were immediately and very greatly increased to enforce these provisions and deal with enemy activities, there sprang into life, almost over-night, the American Protective League. An organization of citizen volunteers, it was a unique development of the situation and in spirit and methods thoroughly characteristic of the American people. The League was born out of a realization of the danger the country faced, overrun as it was with enemy agents directed by some of the most skillful intriguers and spy captains that a nation specializing in spying and intrigue had been able to train, and out of the loyal wish to serve.

The American Protective League, which had its

tion of war, was a volunteer auxiliary of the Department of Justice. Its organizer, a private citizen who saw the necessity of such service and the possibility of securing the effective coöperation of selected persons everywhere, had it in operation within a few weeks, with several thousand members. It grew rapidly and within a year had 250,000 members working for it in their own communities. The organization was established in every state in the Union, the country being cut up into divisions, each under a chief, and each division into districts with a captain in command of each one, while each captain recruited his own working squads and put them under lieutenants. This organization by territory was reënforced by another whose divisions were along the lines of important industries, trades and professions, the two bureaus working constantly in coöperation. In the membership of the League was represented every section and phase of American life—college professors and day laborers, bank presidents and mechanics, journalists, lawyers, janitors, ministers, carpenters, judges. The very great value of its service was due to this variety and to the intelligence and character of its membership, for it was able to penetrate into all circles, to be on the watch everywhere in city, town and country and to follow a suspect through the most devious of wanderings. It investigated pro-German propaganda of every sort, sabotage cases, suspected spies and their activities, seditious speeches and printed matter, efforts to evade the selective service act, lying reports circulated by the "whispering propaganda" method

about American organizations or individuals, and suspected treasonable conspiracies.

The members of the League, undertaking its work in addition to the duties of their regular occupations, served without pay and without rendering expense accounts. It carried on 3,000,000 investigations upon which it made reports, a great many resulting in the uncovering of serious disloyalties or enemy activities. So efficient was the organization that it won the warmest praise from the Attorney General of the United States, who declared that not only were its active services of very great value but that its passive effect was of equal importance, because the knowledge that its eyes and ears were everywhere had a most discouraging influence upon enemy and disloyal intentions.

Under the Trading with the Enemy Act, passed early in our war progress, an Alien Property Custodian took charge of properties and businesses belonging to enemy aliens in this country or operated for the benefit of enemy subjects elsewhere. The investigations which uncovered these business operations, many of them deeply and cleverly concealed, revealed startling facts as to the extent to which German subjects had gained commercial and industrial footholds in the United States, the methods which they had used and the purposes to which they had applied their resources and their knowledge of the nation's business and industrial life. More than thirty thousand cases of enemy owned business were handled by the Custodian, while enemy owned stock, ranging in the several cases from fifteen to one hundred per cent of the total, was found in nearly three hundred corporations. He seized enemy owned prop-

than $700,000,000, the businesses in which it was engaged running the whole gamut of American industry in mining, manufacturing, buying and selling. Frequently the enemy ownership was so cleverly and persistently concealed that months of investigation were necessary to uncover the truth. A great many of these German owned industrial establishments were used as spy centers and were filled with the agents of Germany plotting for political and industrial domination. In order to protect the country in the future and prevent a repetition of this attempt to conceal a knife meant for her heart, the Alien Property Custodian was authorized by Congress to sell to American citizens all enemy owned businesses, the proceeds to be deposited in the United States Treasury to await decision concerning it by the Peace Congress which should settle the problems growing out of the war.

Not only did the volunteer organization of the American Protective League undertake to uncover and stop enemy and disloyal activities, but a large percentage of the American people individually endeavored to aid the authorities in the same way. So intense was the general indignation against Germany and the Germans because of their insidious methods and the extent to which they had abused the friendly attitude of America and so high was the spirit of loyalty that young and old, rich and poor, were everywhere on the watch for signs of disloyal sentiment. Sometimes this eagerness overstepped common sense and degenerated into unthinking persecution of people of German birth or extraction who were good and loyal citizens. It resulted also in the circulation of

many wild rumors of spy activity without basis of truth. But it also had undoubted good result in the discouraging of the underground activities of the enemy.

Germany expected confidently that her well organized and richly provided spy service, her extensive propaganda and her hold upon business would enable her to undermine and palsy America's war effort. But all her careful preparations and the huge sums of money she expended profited her scarcely at all. The great majority of American citizens of German blood or birth proved to be loyal to the United States. The swift hand of justice at once grasped and put under guard so many of Germany's agents that the rest were unwilling to run the risk of continued activity. Over 6,000 enemy aliens were arrested under warrants and 4,000 were interned in army detention camps for the period of the war. Systematic disloyal propaganda failed so completely to produce its desired results, was everywhere so frowned upon and was so likely to be fraught with danger for those behind it that it dwindled rapidly. By the end of our first year of war pro-German and anti-American propagandists had realized the futility of their attempts.

Notwithstanding all the preparations and efforts of the enemy to breed disloyalty and create disorder and lawlessness and our own lack at first of legal machinery with which to meet the situation, Germany's underground operations were squarely met and wholly defeated and the country was never more quiet and law-abiding than it was during all the period of the war.

CHAPTER XXXV

AT THE HEART OF THE NATION

IN the memory of those who knew it during the war Washington will ever stand out as an epitome of the titanic achievements of the country. There beat the heart of the nation and there could be felt, as nowhere else, its mighty and determined pulses. There was the source of every great activity and there, with the burning intensity of sunbeams focused through a lens, the spirit of the people was making itself manifest.

The war found the capital of the United States, just as it had been for many years, quiet and leisurely, aloof from business and industry, spacious and restful and lovely. And the war transformed it with lightning speed into a busy hive of war making industry, crammed with people, humming with prodigious labors, striving mightily to achieve what seemed the impossible in a hundred different ways at the same time.

The vast expansion in every war making or war administration agency of the Government and the creation of new agencies that began at once had, of course, their source and direction in Washington and there their machinery had to be housed and operated. First to outgrow its former allocation of space in the huge State, War and Navy Building,

ample for the peace time needs of all three Departments, was the War Department. As the expansion in each of its divisions increased from day to day, it overflowed into other buildings, and one immense structure after another, nearly a dozen in all, was rushed to completion to house its activities. The Navy Department and the Treasury Department each had its own difficulties, although in neither was the expansion so great as in that of War. In the great Treasury building entrances were closed and corridors screened to make more desk room and buildings and office space were leased elsewhere to accommodate the many thousands of new employees who were needed for the vast amount of expert and clerical work suddenly made necessary in connection with the income tax, the War Risk Insurance, the Liberty Loan bonds, the War Stamps. The War Risk Insurance Bureau, newly created, alone required 17,000 workers. The new agencies that were being formed, each one of them growing like a Jonah's gourd—such as the Food Administration, the Fuel Administration, the Council of National Defense, the War Trade Board, the War Industries Board,—each had to be put under a roof big enough for its constantly expanding forces.

An enormous building program was instituted almost overnight, planned and executed in an amazingly short time. And in the meantime these new, or expanding, war activities had to be housed anywhere that a vacant building or a few rooms could be found. Perhaps two or three old dwellings, hastily remodeled inside for office purposes, were thrown together, or a vacant theater was taken over, or rooms were rented in office buildings. The Council of National

Defense began its work in three rooms in an office building and a year later it was overflowing into two other buildings from a huge structure of its own containing four hundred rooms which had been built from foundation to its last electric light fixture in seven weeks. The Food Administration grew within six months from two rooms and three people to an enormous organization whose headquarters in Washington filled a structure of nearly a thousand rooms, each room containing from two to ten people, and within the next year it had overflowed into and filled another building of almost equal size. The War Trade Building covered an entire block of space and in it were 2,200 employees while its mail, handled by its own service, numbered from 4,000 to 5,000 pieces daily. And the histories of the other war agencies are repetitions of these.

Altogether there were built a score of these huge buildings for various war work purposes. If massed together they would have covered sixty acres. Speed and economy were the two essentials in their construction and each of them grew with startling rapidity. Three months was a long time for the erection of any one of them. Seven or eight or ten weeks was the more usual time to elapse from the moment work was begun until the building was ready for occupancy, equipped with steam heating, electric lighting and sprinkler systems, aero fire alarm signals or fire towers, and telephone systems comprising in each one from four hundred to a thousand instruments. Some of the buildings were two and some three stories high. Most of them were built of metal lath finished on the outside with stucco and on the inside with wall board, but in the enormous

VIEW FROM WASHINGTON MONUMENT, AUGUST, 1917

SAME VIEW ONE YEAR LATER, SHOWING WAR BUILDINGS CONSTRUCTED IN THE MEANTIME

War and Navy buildings the materials were steel and concrete.

Measuring approximately from four to six hundred feet by from two to four hundred, each of these great structures covered from three to five acres of ground space, while its floor space, if two stories high, was between 300,000 and 400,000 square feet, but from eight to fifteen acres if higher. Its long corridors, stretching out in separate wings in parallel lines from the front section, or "head house," with rows of offices upon each side, if set end to end would have measured a mile, a mile and a half, three miles, in length. Office boys had to use roller skates up and down these hallways in order to economize time. Last and most enormous of these structures were the huge Army and Navy buildings, standing side by side, of steel and concrete, three stories high, containing forty-three acres of floor space and affording accommodations for 10,000 employees. The Navy Department building has a front section or "head house" 860 feet long with nine wings extending from it each 500 feet long and 60 feet wide, while the "head house" of the War Department building is 784 feet long and its eight wings of similar size. The contract for these two buildings was let at the end of February, 1918, and by the middle of the following August the occupants had begun to move in and six weeks later their offices were fully occupied. The cost of the entire building program for the housing of war activities at the capital was $15,000,000.

The work to be done required as much expansion in personnel as in buildings. From all over the country people went to Washington to put their hands, their heads, their shoulders, to the rushing forward

thing almost magical in the suddenness of their appearance and the steadiness with which this stream of humanity poured into the capital. From East and West and North and South came these thousands of men and women, from the seaboards and the mountains, from the middle plains and valleys—business men, captains of industry, lawyers, physicians, bankers, clergymen, college professors, magazine editors, scientific and technical experts, artists, authors, journalists, librarians, welfare workers, stenographers, secretaries, clerks, and each and every one of them found all that his or her hands could do. A great many of them, more than will ever be known, gave their services and the rest received salaries that were hardly more than sufficient, as prices were in wartime Washington, to cover their expenses. They were representative Americans, the cream of America in ability, training, character, patriotism and devotion to democratic ideals, and to see them at their work, to come into touch with their enthusiasm, their eagerness to render service, their teeming ideas, their resourcefulness, their efficiency, energy and determination and to witness the effective running and vast achievements of the huge organizations they were inspiring and directing was to watch the steady, sure beating of the very heart of the nation.

In April, 1917, Washington had a population of 360,000, with scant facilities for receiving and caring for the army of workers that almost at once began to stream into it. At the end of the next seven months a careful census that did not include transients nor men in camps within the city showed that 50,000 people had been added to the population. And

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